101 Transportation

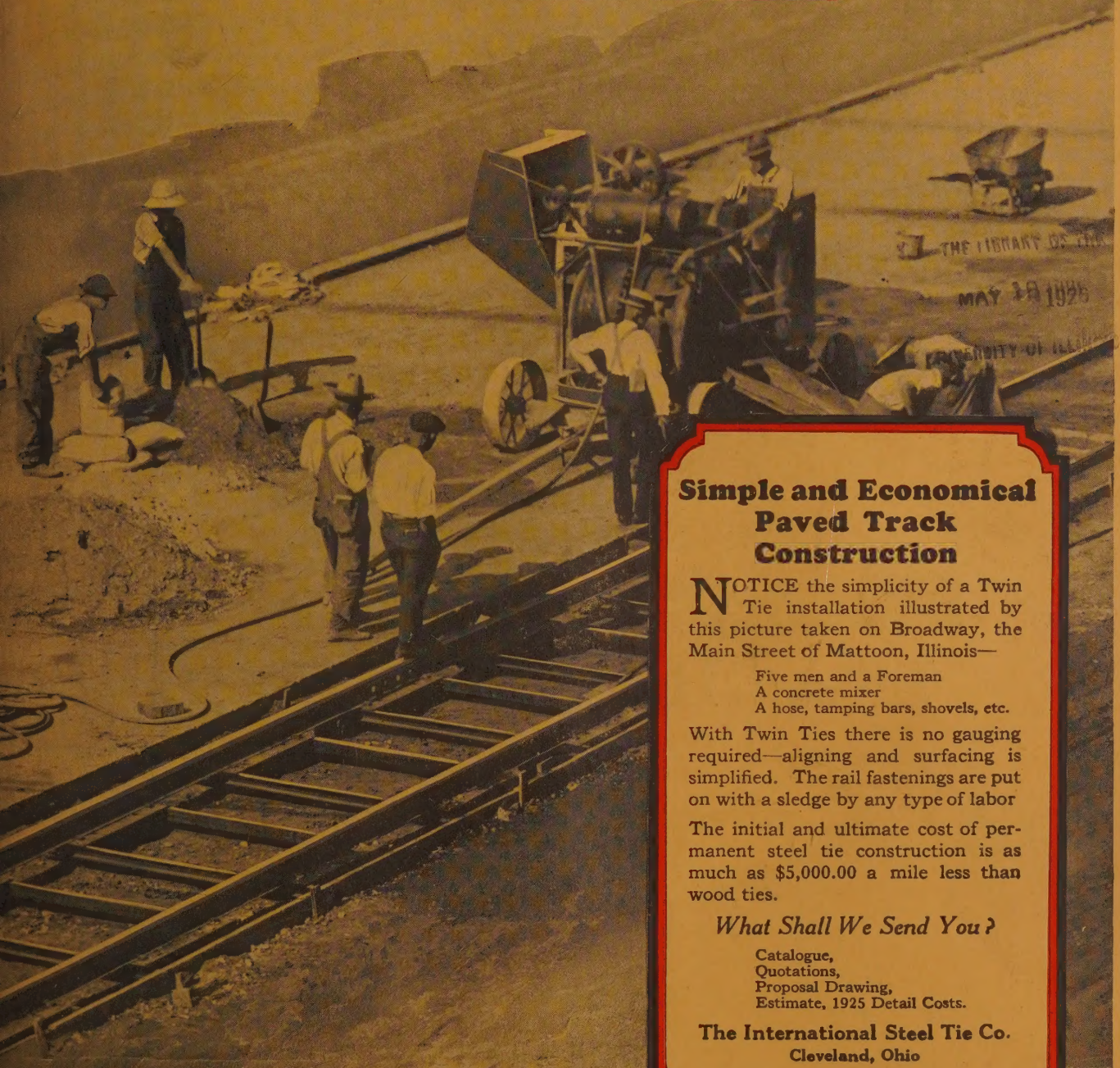
McGraw-Hill Publishing Company, Inc.

MAINTENANCE ISSUE

May 15, 1926

Twenty Cents per Copy

ELECTRIC RAILWAY JOURNAL



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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 67 New York, Saturday, May 15, 1926 *Number* 20

Better Maintenance on New Equipment

THROUGHOUT the electric railway industry there is evidence of growing interest in both the replacement of obsolete equipment and in the improvement of new car design. Numerous examples are available which demonstrate conclusively that new, lighter and more attractive cars may completely change the status of an electric railway property.

As interest in the substitution of modern for obsolete cars has increased, much has been said and written about the reduction in maintenance costs that results. Obviously this is an important advantage. But there is some danger of carrying the effort to reduce costs to an extreme. When new cars first replace old, dilapidated equipment the contrast is so marked and the effect on the shop so striking that there is a tendency to overlook the application of the adage "A stitch in time saves nine" to a new car as well as to an old one. Since at first so little maintenance attention is required on new cars in comparison with those that have seen better days, there is some tendency to neglect little, necessary, day-to-day repairs that are inevitable. It is a mistake to cut maintenance appropriations to a point where it is not possible to keep the cars in first-class condition.

Some examples are available of the need for better maintenance of new equipment. Unless adequate provision is made for taking care of the wear and tear from service as fast as it occurs even a new car soon begins to look dingy and down at the wheels. Eternal vigilance is the price of good-looking equipment. Unless this price is paid the depreciation process becomes cumulative and much of the value of the investment in new cars is lost.

Stream-Lining Shop Furniture

MOST electric railway shops build their own cabinets, closets, benches, material bins, racks, etc. The size, arrangement and design of these is usually left to the particular foreman who orders the piece of equipment. The result obtained is a conglomeration that cannot be arranged with any degree of uniformity. In addition to giving a bad appearance, the cost of construction is greater than it would be were a more uniform design used. This certainly is a fertile field for standardization, not only for the individual railway property but for the industry as a whole.

Many advantages not at once apparent have been found through standardization of such shop accessories by the Department of Street Railways, Detroit, Mich. By establishing a definite series of dimensions for cabinets and similar furniture, a new sketch or drawing is not required each time a new piece is to be made. When installed, the new equipment can be lined up with similar pieces already constructed, so as to give a uniform appearance. Steel construction reduces fire hazards, and for storage of most shop material is preferable to wood. This standardization has been extended to include boxes for scrap material, cans for oily waste, rags, etc., ovens for drying out wood stock and other parts that have a tendency to collect moisture in storage, stands for overhauling various equipment parts, paint and oil receptacles, storeroom bins and shelving, stock racks for convenience of overhauling crews and the usual types of closets and cabinets.

Other roads can well profit by a similar standardization of shop furniture, and no doubt the scheme of standardization might be extended to all railways, so that manufacturers would find it advantageous to take up the building of shop furniture as they now provide office furniture and so develop a line that could be used by all railway shops.

Close Machined Fits Will Reduce Maintenance Troubles

INCREASED attention now being given in various electric railway shops to more accurate machining of fitted parts is very encouraging, as sloppy fits have been considered the rule rather than the exception on electric railway properties. Manufacturers who are used to close machined fits have criticised the machining methods of electric railways as being responsible for many of the failures of equipment. There is no doubt that the extra care and cost necessary to produce close fits will be paid for several times over in longer service from wearing parts and decreases in trouble to equipment.

In the past, more attention has been given to fitting armature bearings to their shafts than at other points in the car equipment. The present standard plus allowance for armature bearing bores before bearings are pressed into housings is from 0.006 in. to 0.020 in., depending on the diameter of the axle. Bronze bearings will close in approximately 0.002 in. when forced into place. Many roads are now insisting on a maximum clearance over the shaft of not more than 0.006 in. for armature bearings after they are in place. These roads report very satisfactory results.

The usual practice in regard to axle bearings is to permit a considerably greater initial clearance than for armature bearings. Limits of from 0.015 in. to 0.017 in. have been considered good practice. Much less attention is also given axle bearings to determine wear after they are placed in service, and often they

This is the issue in May that is devoted essentially to maintenance subjects

are continued in operation with entirely too great wear. There is no reason why closer fits cannot be used, and certainly more careful attention should be given to determine just what the wear is and to remove the bearings before excessive clearance results.

There are many other points in the car equipment where closer fits will prove of advantage. Journal bearings, journal bearing wedges, journal boxes and their guides, pedestal gibs, truck bolster chafing plates and the various fulcrum points for brake levers are some truck parts that should be watched carefully. Master mechanics should get behind the movement for more accurate machining in electric railway shops and show the managements that this is one way of reducing maintenance costs and preventing trouble. The results obtained will later prove an excellent example of the desirability of modern machine tools to produce more accurate machining.

Public Preference Must Receive Consideration

OPERATION of buses by the New Haven Railroad between Providence and Boston is objected to by H. C. Attwill, chairman of the Massachusetts Department of Public Utilities, principally because he believes that it would constitute an unwise duplication of facilities. His opinion, dissenting from that of the commission as a whole, is given in greater detail in the news pages of this issue. It is more economical, he says, to carry 70 passengers by rail than to carry 35 by rail and 35 by bus. That "there are those who prefer to ride in buses rather than on rails" is not a sufficient reason, to his way of thinking, to grant a certificate of convenience and necessity.

While this reasoning may be theoretically sound, it does not work out well in practice nowadays. It is futile to suppose that people who want to ride in automotive vehicles can be made to ride on rails by refusing permits for bus operation. They have their own private automobiles. Moreover, in this particular case competition from independent bus operators already has been established through the lack of interstate regulation. Denying the railroad the right to operate buses would not greatly increase the rail traffic, but would simply throw this business to the railroad's competitors.

Regulatory bodies can be of inestimable value to the public by protecting the established transportation agencies from the inroads of such competitors as tend merely to destroy a service which they are unable to replace. On the other hand, if the people who want some new type of transportation are willing to pay for it, and if the established agency is willing to furnish the service, it is better to recognize this public preference than to try to compel everybody to use some particular means. The *reductio ad absurdum* of that argument would be to make all steam railroad passengers ride in day coaches because they can be carried more economically that way than in Pullman cars.

Duplication of the local facilities of the electric railways is a more serious objection to bus operation by steam railroads. It would be most unfortunate if, as Mr. Attwill fears, such operation should develop into a fight for local traffic. By an agreement that the steam railroad buses shall not carry passengers between the points served by the electric lines that outcome usually can be avoided.

Make Shop Cleaning a Continuous Performance Instead of an Annual Affair

SPRING house cleaning, clean-up week in our cities and the inspiring freshness of new vegetation serve as excellent examples of the beneficial effects of clean surroundings. Much dirty work must be done in electric railway shops, but that is no reason why dirt and disorder should continue to exist. Cleanliness increases production, helps to produce better work and makes the workmen more contented. Many electric railways institute a spring cleaning campaign annually and good results are obtained. Why not continue to stress the need for cleaning up daily? Employees will take more pride in their work and will be more willing to broadcast the fact that they work for the railway if the shops are made something to be proud of.

One of the most impressive things noted by the members of the equipment committee of the American Electric Railway Engineering Association in their recent trip through the River Rouge plant of the Ford Motor Company at Detroit was the cleanliness of everything. The weather on that particular day was foggy and rainy and of a kind to produce a depressing effect, but the constant attention given to cleanliness in the yards and buildings made all parts inviting. The pleasing effect was commented on by several of the members of the party, and all went back to their respective railway properties with an inspiring example of the beneficial effect of cleanliness.

There is an old saying, "it is better to wear out than to rust out." Dirt causes disorders and may cover up defects. A layer of rust may do more damage than a year of wear, and the success of a property is most often judged by the appearance of its buildings, shops and equipment. Put on a bold front and make your railway property attractive by continual cleaning.

Maintenance Departments Demand First Consideration

GENERAL managers of electric railways, if they give the subject of maintenance sufficient thought, cannot fail to realize that it constitutes the foundation for the most effective methods of merchandising transportation. Not only is it essential that cars be kept on the road, but, also that they present an attractive appearance, be free from annoying delays to service and provide conveniences that passengers expect. The various maintenance departments are vital factors in the success of any railway property.

Many electric railways are laboring under severe handicaps due to unattractiveness of their cars, frequent breakdowns which upset schedules, and lack of properly maintained tracks or lines. A passenger on one of the electric cars in a Mid-Western city was recently heard to remark: "I wish they would take off these old cars and give us buses." When pressed for a reason for the remark, he volunteered: "Those new interurban buses are far more comfortable and attractive than the street cars, make better speed and are reliable." Modern cars properly maintained will do away with most complaints of that nature. New, up-to-date cars, however, will not long continue to please unless a high grade of maintenance keeps them free from troubles.

Cars do not produce revenue while in the shops for repairs. Every additional minute that a car is withheld from service means just so much loss. It is, there-

fore, most essential that the organization and tools provided for making repairs be kept at their highest state of efficiency and that the most modern tools be provided. A large number of machine tools may not be needed, but care should be used in their selection and arrangement so that the maintenance work can be done most efficiently.

Maintenance departments have not been given the consideration that they merit and have not received their share of funds with which to carry on properly. For attraction of increased riding, electric railways must establish service on a solid foundation, and that requires better shops, better machine tools, better material to work with and better wages for the maintenance force.

Clear Thinking and Lots of It Should Be the Keynote of Conventions

DIRECT concern to those in the electric railway industry was seen in a note sounded at the Galveston meeting of the Southwestern Public Service Association last month. Just as the meetings of a few years ago were maintenance talks, today they are not only that but much more. In fact, the burden is becoming heavy indeed and the problems to be studied require the careful consideration of operators and manufacturers as well. The service of ten years hence will require facilities and methods perhaps unknown today. This is a job for the manufacturer as much as for the operator. The manufacturers must lead in adapting new principles to products. They cannot afford to sit back and try to sell antiquated equipment nor wait to have the operator design his own product. Operators are not necessarily the best designers and should not be called on so to diversify their energy.

All this calls for a more serious consideration of the discussions of papers presented at meetings and conventions. The industry is moving rapidly and often through dangerous channels.

This is not a passing editorial fancy, but a thought that is having the earnest attention of important executives. The time is here that this question should be faced squarely to the end that railway meetings may be even more productive of progress than they are today. Hilarity and entertainment have their place, but today clear thinking and lots of it are the prime necessities.

Special Remuneration Often Leads to Stimulated Brain Action

VERBAL pyrotechnics may play a part in encouraging railway employees to apply a little gray matter to the subject of the company's welfare, but a suggestion of special remuneration cannot have other than a stimulating effect in backing up the talk. Hence the instant appeal provided by the "Suggestion Department" of the Pittsburgh Railways. All suggestions, both great and small, are carefully reviewed by the company, judged upon their respective merits and duly rewarded by suitable sums ranging from $5 to $75.

Employees have been quick to seize upon this opportunity of capitalizing on the ideas which crop up from time to time, even in the minds of the most mechanized of humans. These suggestions, not being limited to any particular field of railway activity, are offered by employees in every branch of the organization, and vary from the highly valuable to the utterly worthless in character. However, even should it require an average of ten worthless ideas to produce one real money maker or saver, who shall say that the end was not worthy of the means?

College professors are expected to maintain their prestige by the writing of frequent papers and books along the lines of their chosen subjects. Similarly, master mechanics who are ever on the outlook for methods of simplifying and cheapening maintenance work will stand high in the estimation of their company executives. Since they cannot themselves hope to devote sufficient time to accomplish the whole task, they must rely on their subordinates to provide usable suggestions. The suggestion department perhaps may be said to attain its ultimate of usefulness among the shop workers. A practical example of the functioning of this plan is detailed elsewhere in this issue.

Too Much of a Bad Thing at Akron

ECONOMIC waste has run high in Akron, Ohio, as a result of interruptions to its transportation service through strikes there in the last fifteen years. Statisticians would be required to count the cost to the local railway, the merchants and employees of the railway and other workers, to say nothing of the untold inconvenience inflicted on the residents of the city. These strikes have lasted from one to eleven days. Each time the result has been the same so far as the company is concerned—a settlement at the railway's expense with labor less amenable to discipline than before.

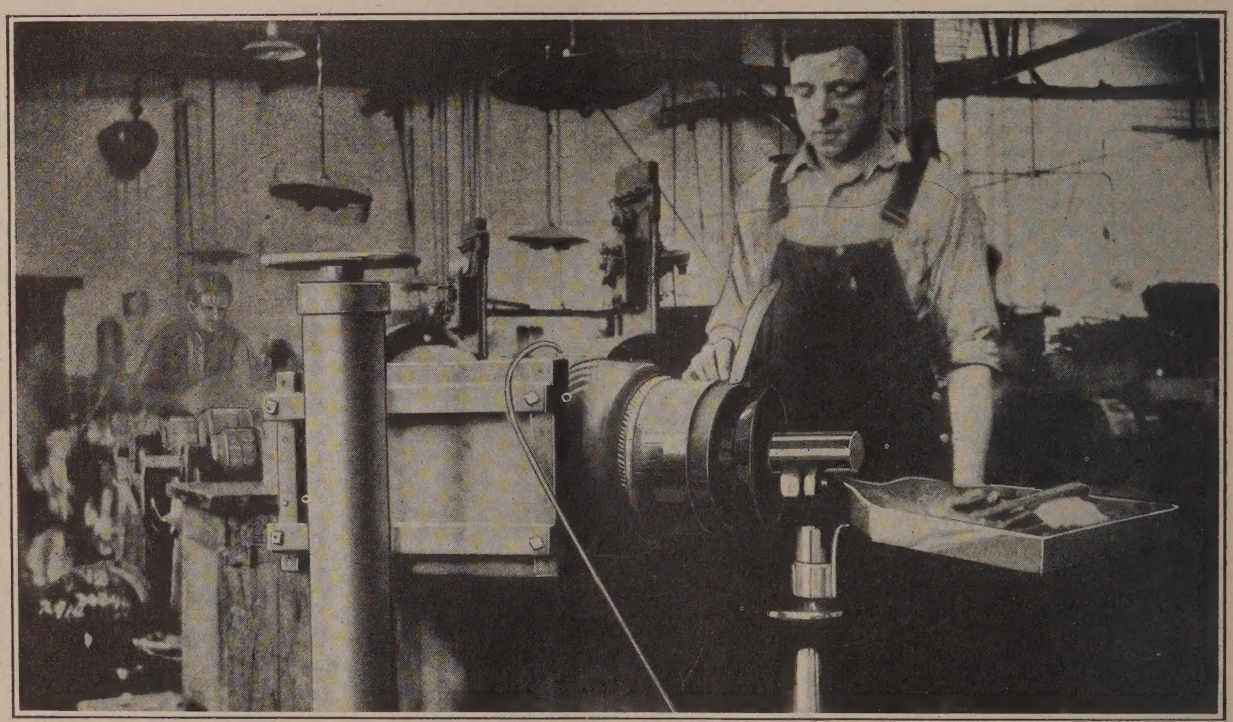
The record of events at Akron in these controversies may differ in its details from similar records elsewhere, but the story of union usurpation is very much the same everywhere in this industry. Always there has been the same disposition on the part of labor to go to the extreme by insisting on having its way about petty details. Of course, the question of an increase in wages —one of the issues in the present controversy—is not a petty detail either to the men or the company, but that of union insistence that the company deprive men who did not pay their union dues of their seniority, however much the union might like to magnify its importance, is a detail too petty to be made a basis for calling a strike. This last is an old issue in the history of union activity. It probably was not so much either of these issues as the summary way in which this latest strike was inflicted that prompted the Akron company to make a determined stand against the union. In this case the old union argument does not hold that any temporizing by it fortifies the opposition in its position by making it possible for the company to prepare adequately to give battle.

Sympathy with labor, particularly in a city like Akron, is not usually slow to assert itself. Yet in this instance the public has been apathetic. It is apathetic because it has been fed up on this sort of thing and because it has appraised the issues correctly—issues that have been clearly stated in the JOURNAL. The story makes interesting reading, particularly that part of it which has to do with the conditions under which service is being restored. When all things are considered, and with due respect to the company, the wonder is not so much that it was decided in this instance to see the issue through but that the company went so far as it did in its effort amicably to reach a settlement.

Improved Testing Decreases Armature Open Circuits

The Difficult Problem of Locating Partial Open Circuits in Armatures so that Repairs Can Be Made Before a Total Open Circuit Results Has Been Brought Nearer to a Solution in Chicago by Improved Testing Methods—Of Three Methods, Measurement of Coil Resistance with a Wheatstone Bridge Has Been Found Most Reliable

By W. C. Wheeler
Engineer of Equipment Chicago Surface Lines, Chicago, Ill.



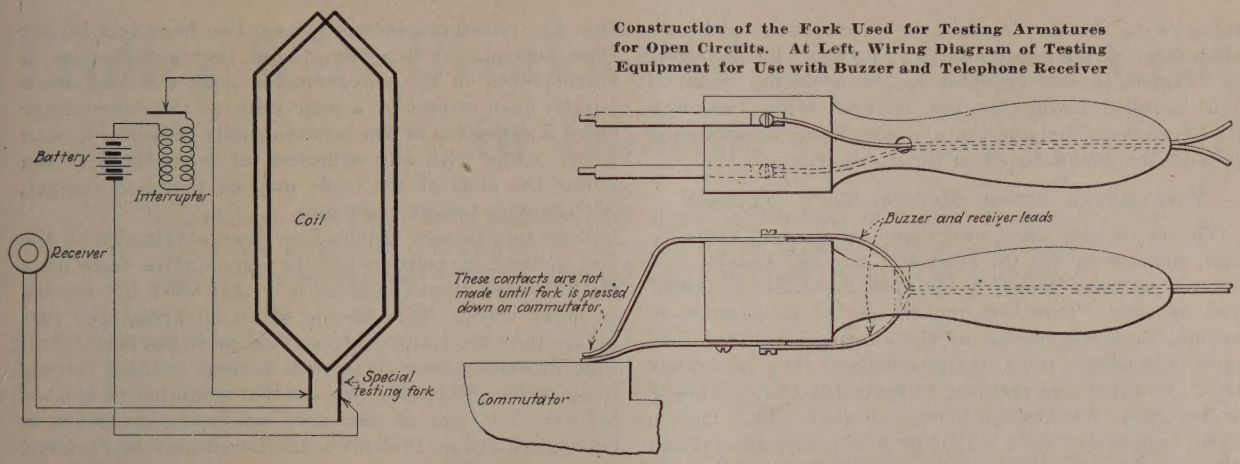
Transformer Test Provides an Alternating Field in Which the Armature Is Placed to Develop an Alternating Emf. in the Coils. A Piece of Metal Bridges Adjacent Commutator Bars

DUE to the characteristics of railway motors, an open circuit in the armature windings will in time cause flashing and consequent arcing and burning of the commutator. This necessitates removal and repairs to the armature and winding. Some railway men believe that open circuits are caused by vibration of the coil structure, which stresses the lead where it enters the commutator ear, and in time results in a fatigue break. Others hold that the crystallization of hard copper causes opens, or that the so-called bucking of the motors during emergency stops is a contributory factor.

Whatever the cause, it is well known that some armatures are more prone to develop open circuits than others. This may be inherent to the design or other causes which are met with in operation. It has been noted that some armatures will not have an open circuit for years and will then become persistent offenders, or repeaters. Observations made also would indicate that the formation of an open circuit in a winding may be a gradual process and that an armature may run for some time with a great many leads practically open. On the Chicago Surface Lines armatures have been found operating with ten to twenty opens and one armature which was sent in for repairs due to damage caused by one open circuit was found to have 51 top leads broken.

Taking these points into consideration the testing of armatures when they are repaired becomes very important. If potential opens can be located while the armature is undergoing repairs, they can also be repaired and the armature will remain in service for a considerably longer time than would be possible had it been allowed to return to service with one or more leads half broken or wholly broken in two but still in contact.

In the development of testing methods for open circuits by the armature repair department of the Chicago Surface Lines three electrical methods have been introduced at different times, all of which have been used in connection with a mechanical test of each lead with a

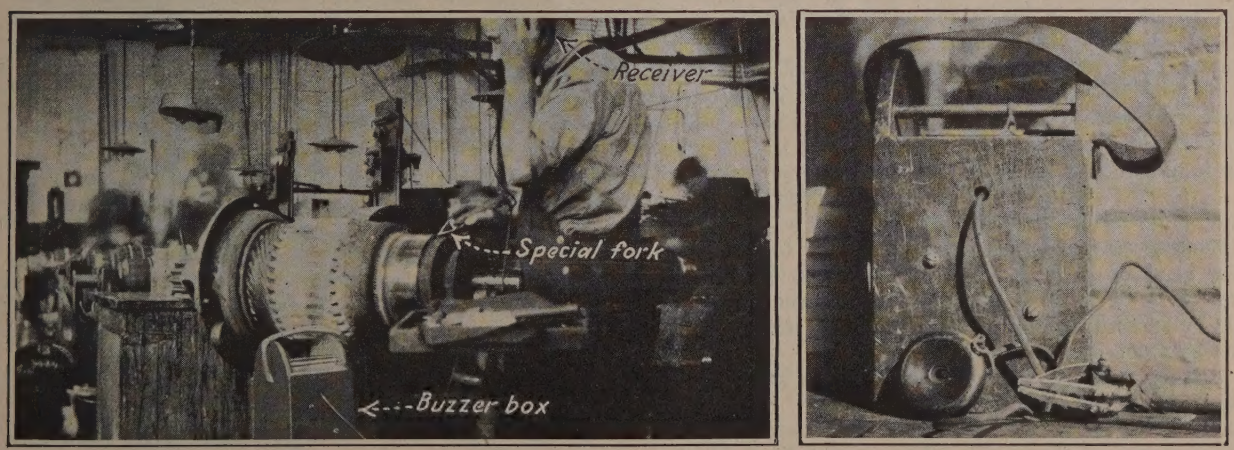


Construction of the Fork Used for Testing Armatures for Open Circuits. At Left, Wiring Diagram of Testing Equipment for Use with Buzzer and Telephone Receiver

small metal rod which is used to pry up any leads that are not securely fastened. Obviously this mechanical test can be used only on top leads and will locate only leads that are wholly broken in two, but the ends of which may still be in such close contact that they have not caused trouble.

The first electrical method introduced was that of a simple transformer test. The apparatus used is shown in an accompanying illustration. In this test a pole piece is mounted on a movable and adjustable stand and a coil is placed around the pole piece and is connected to an alternating current supply. When this stand is so placed that the armature is in the alternating field produced by the coil, the armature coils within the influence of this field have an alternating electromotive-force developed in them. If a piece of metal is used to short two commutator bars to which one of the energized coils is attached sparking will occur at the bars. The presence of this sparking is taken to indicate that the coil is in good shape. However, due to the character of the winding in most railway motor armatures, it is necessary to have two opens in separate coils to prevent the occurrence of a spark at the commutator under the above conditions. This condition would allow armatures to be passed as being O.K., when they actually contained real opens. After being in service a short time they would develop trouble and have to be returned for repairs. Thus an armature which would have been repaired if it had been properly tested might become a repeater because the open was not found when the armature was tested before leaving the repair department.

The second electrical method made use of an intermittent current which was passed through two parallel circuits, one of which was the armature coil under test and the other a low resistance telephone receiver. The intermittent current is supplied from a dry battery as a primary source through a buzzer. Connections are made through a four-pronged fork so that the buzzer operates only when the fork is pressed on the commutator bars. The buzzer and battery are conveniently mounted in a box. This test requires a bar-to-bar test on the commutator, the condition of the coil being indicated by the intensity of sound in the receiver. It will be seen from the wiring diagram shown for this test that when the connections at the commutator ears are in good shape and the coil is not open that due to its low resistance the greater portion of the current passes through the coil and only a small amount through the telephone receiver. If the connections are poor or the coil partly open a greater amount of current passes through the receiver, and if the coil is open all the current passes through the receiver, producing a loud sound. Thus the intensity of the sound in the receiver is an indication of the condition of the coil. An experienced operator can detect coils that are not sufficiently open to cause trouble, but which soon will break down. This test is very simple to install and cheap to operate. It is



At Left, An Intermittent Current Supplied from a Dry Battery Is Passed Through a Buzzer. A Telephone Receiver Is Used to Approximate the Resistance by the Volume of Sound Produced. At Right, Buzzer Box Showing the Receiver and Special Testing Fork Used

superior to the first method in effectiveness, although shop noises are a disadvantage in its use. If the buzzer is wrapped in felt or other sound-insulating material and installed inside the box without rigid fastening its sound is muffled and there is less chance of confusing it with the sound heard in the receiver.

WHEATSTONE BRIDGE METHOD MOST ACCURATE

The third and latest electrical test used in the Chicago shops is by far the most accurate and reliable test devised so far. It also is the most expensive to install and operate. This test makes use of a Wheatstone bridge for measurement of the electrical resistance of each individual circuit in the armature by a bar-to-bar test. Two men are required to make the test. A Leeds & Northrup Wheatstone bridge is used. This instrument is provided with a dial on which resistance from 0 to 100 ohms may be read directly. Provision is made for use up to 1,000,000 ohms by use of multipliers contained within the instrument. It is very handy for other resistance measurements, but particularly so for testing armatures.

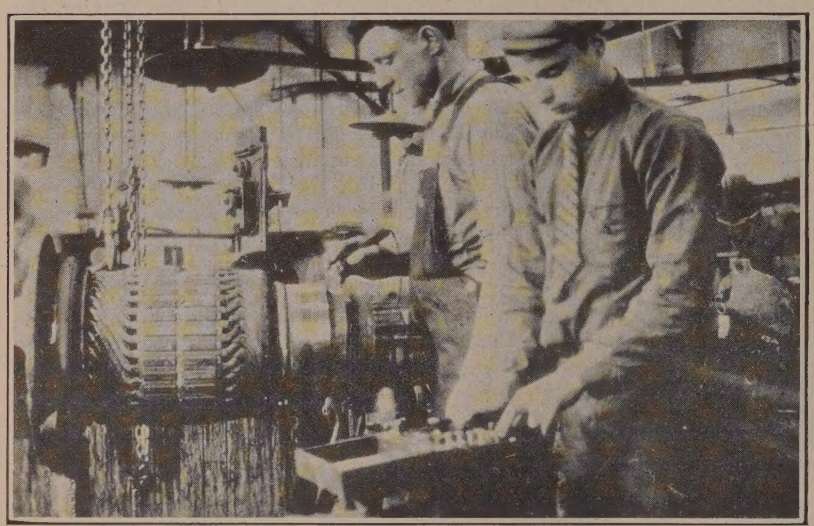
A fork is used with this instrument, which is similar to the one used in the second method of testing except that it has only two prongs. In making the test contact is made with the fork on two adjacent commutator bars and the dial is adjusted until the galvanometer comes to rest. On the common sizes of street railway motors this value is in the order of 0.14 to 0.25 ohms, including the low resistance leads from the instrument.

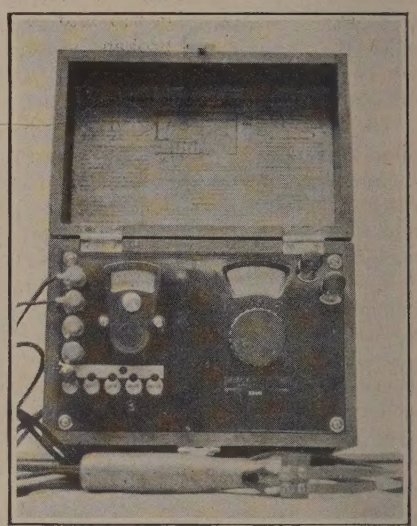
After the position of the dial has been determined for the armature it is only necessary to watch the galvanometer as the fork is passed from bar to bar around the armature. It is necessary to pause on each bar long enough for the galvanometer to come to rest, as the movement from one bar to another usually causes a slight deflection.

If the armature is in good condition the galvanometer will register the same for all the bars. If, however, there is a poor connection to the commutator or if the cross-section of the wire has been materially reduced at any point, such as would be the case had a break started, the galvanometer would deflect to one side, indicating that the resistance between these two bars was higher than normal. It has been found that a deflection of three points on the galvanometer scale will indicate a partial open circuit or a poor joint at the commutator ear. A deflection of five points usually indicates a clean break, while with any deflection of from three to ten points the ends of the leads may be found in contact, but the wire broken completely.

Very satisfactory results have been obtained with the last method of testing, and in comparative tests open circuits have been found with it that were not located in other ways. This test is given all armatures just before they are returned to service, as it has been found that in some cases opens will become evident during the dipping and baking process that could not be located before. The test is also used while the armature is being repaired so that all opens found may be repaired at one time.

It is felt that this practice makes for armatures that are in the best possible condition when they leave the repair department, in that they have been cleared of the potential opens or partial breaks in the leads and that consequently they will remain in service for longer periods before failure.





At Left, Electrical Resistance Measured by a Wheatstone Bridge Has Been Found the Most Accurate and Reliable Test for Open Circuits. At Right, the Instrument Used for Measuring Resistance Is a Leeds & Northrup Wheatstone Bridge Ohmmeter

Although this method of testing was in service for only about six months of last year, the total number of armatures repaired on account of open circuits during the year was 12 per cent less than those repaired for the same cause during the preceding year.

The Leeds & Northrup instrument for the improved test costs more than other testing equipment that has been used, but the money is well invested when the amount of labor and time saved are taken into consideration. This instrument has a decided advantage over the millivoltmeter method in use in some shops for it is self-contained and easily transported to any point in the shop. The instrument will also be found particularly useful for making other electrical tests on car equipment. On small properties, where continual use in the armature repair department is unnecessary, such an instrument can be used to good advantage for locating poor contacts or open circuits in the car wiring and for testing complete motor connections after assembly.

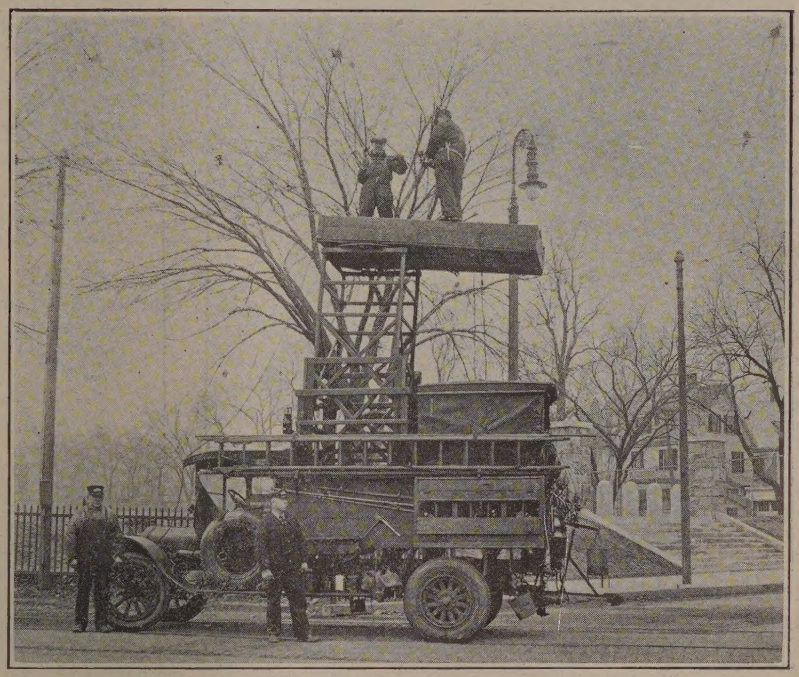
Trolley Wire Breaks Reduced 43 per Cent in Boston

Inspections Are Now Made Regularly on Basis of Number of Wheel Passes—Operating Data Are Furnished by Transportation Department—Many Interruptions to Service Have Been Prevented and Line Maintenance Costs Reduced

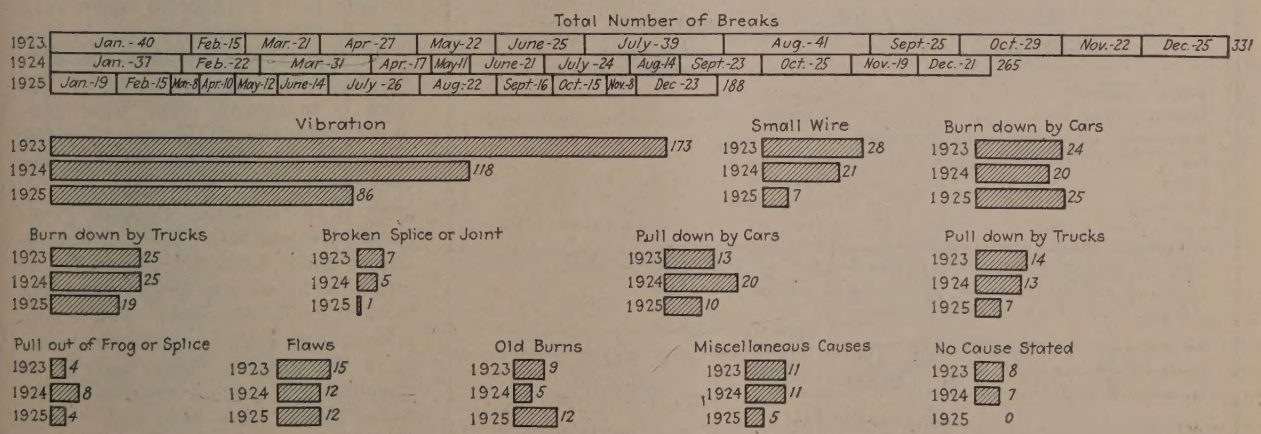
USE rather than the mere passage of time has been made the basis of inspecting overhead wires on the Boston Elevated Railway system. Previously it was the practice to make such inspections about once in four months regardless of the wear on the wire during this period. It was felt by J. P. Boyden, superintendent of wires, that this method was unsatisfactory because of the difference in the wear on various sections. For example, in the Tremont Street subway there are 2,295 trolley wheel passes per day, while on some of the outlying lines the number is as low as 61. The basis was changed, therefore, so that inspections are now made on a basis of 200,000 trolley wheel passes. This has effected a reduction of 43 per cent in wire breaks and a corresponding decrease in line maintenance costs.

In 1923 under the old system there were 331 trolley wire breaks. During 1924, the transition period from the old to the new system, there were 265 breaks. In 1925, with the new inspection method in effect throughout the year, there were only 188 breaks. The record for these three years is shown graphically in an accompanying chart. Totals are subdivided according to months and also according to causes of breaks. The latter classification is based on reports made by the foremen of repair crews on the form which is reproduced on another page.

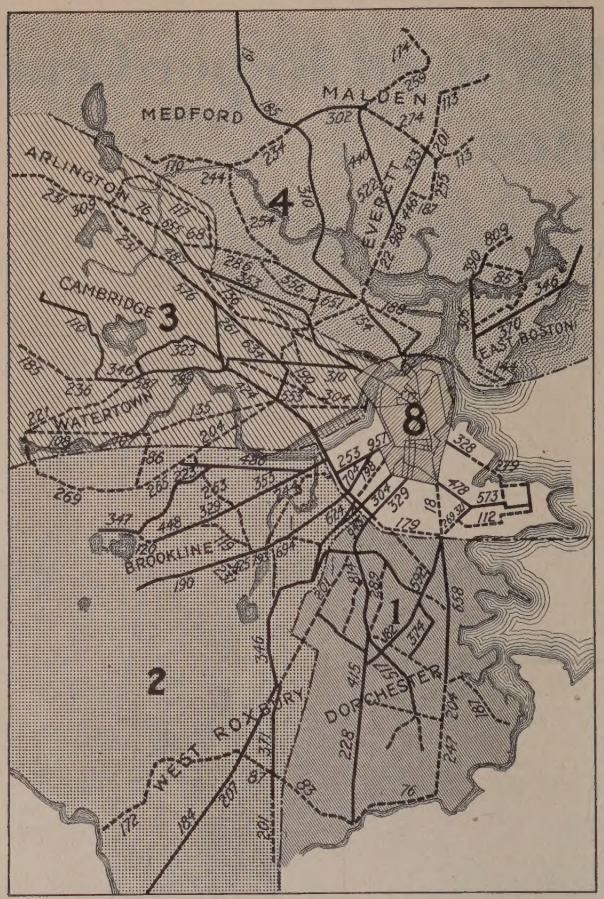
As an aid to the line department, the time-table department has prepared a map showing the daily number of car passes on all lines of the Elevated system. Where the service is more frequent than 300 cars per day or where vehicular traffic is particularly heavy inspection of overhead wires is done at night. This trolley wheel pass map is shown in an accompanying illustration, the day and night inspection lines being



Line Crew and Tower Truck of Boston Elevated Railway Engaged on Periodic Ear Renewal Work



Record of Trolley Wire Breaks for Past Three Years Shows Steady Improvement



System Map Showing Daily Number of Trolley Wheel Passes

Solid lines indicate routes where inspections are made at night; dotted lines are day inspection routes. Divisions correspond to the operating divisions of transportation department except that the downtown area is handled separately and retains its former designation, "Division 8." This comprises the shaded and unshaded areas in the central part of the city. All work in the shaded area is done by night crews.

Form 6463 1-25-2500 63

Report on Ear Renewals and Gauges of Wire

Date July 21-25 Street Boylston St. B line
From Express St To 60/153

Pole No.	Gauge	Pole No.	Gauge	Pole No.	Gauge	Pole No.	Gauge	Pole No.	Gauge	Pole No.	Gauge
60/39		60/51	S1	60/73	2/0	P.O.1	S1	60/137	2/0	P.O.1	G1
Frog	2/0	60/53	S2	60/75	G1	P.O.2	S1	60/139	SF 2/0	60/153	S1
P.O.1	2/0	60/55	S1	60/77	SF G1	60/125	SF 2/0	60/141	G1		
P.O.2	S2	60/57	S2	60/79	S1	P.O.1	S1	60/143	G1		
P.O.3	S2	60/59	S2	P.O.1	S1	P.O.2	S1	60/145	G1		
Joint	S1	60/61	S1	P.O.2	G1	P.O.3	G1	P.O.1	S1		
60/41	S1	60/63	SF 2/0			60/127	2/0	60/147	S1		
60/43	2/0	60/65	2/0	60/121	G1	60/129	S1	P.O.1	G1		
60/45	S1	60/67	2/0	P.O.1	2/0	60/131	G1	60/149	SF G1		
60/47	S3	60/69	2/0	P.O.2	S1	60/133	G1	P.O.1	2/0		
60/49	SF S1	60/71	2/0	60/123	S1	60/135	2/0	60/151	G1		

No. of Ears Renewed 47 D.Y. Dow Ears. 6-4/0 S.F. Ears. 2 Mac J.H. Ears
Ears Tubed 5 Ears Tubed
New Wire Cut in at 60/47 S.B
Remarks: Cut Bd. Rail
O New piece has been cut in.
Signed J. E. McGurk

Instructions to Foreman
Merit 9-0-27.
Renew 60/39 Frog to 61

Date Supt. of Wires J.P.B.

Form Used to Show Condition at Inspections

Note—*G1* denotes gage 1, etc. *S1* denotes slack gage 1; this is between gage 1 and gage 2. *SF* denotes side feed ear.

distinguished by different symbols. All work in the congested downtown district is done by the night crews. New maps are prepared from time to time by the timetable department when rerouting or other changes cause a substantial alteration in the amount of service operated. Small schedule changes are believed to be unimportant from the viewpoint of the line department and no attention is paid to them.

Renewing of ears and gaging of wire are done at the same time. A program of ear renewal was begun in the spring of 1924, reports being made on a form which is reproduced herewith. Ears are removed as soon as the lips are worn down so that the trolley wheels are running on the wire, as it is thought to be cheaper to renew ears than to renew wire.

At the same time that the ears are inspected the diameter of the wire is measured. The wire generally used on the Boston Elevated system is size No. 00. When it has been worn down to No. 3 B. & S. gage it is renewed. Outdoor overhead wire has been found to have a life of about 1,000,000 wheel passes, while in the subway the average life is about 2,000,000 passes. The longer life in the subway is attributable, it is thought, to closer spacing of supports and greater tension in the wire itself. Ears have been found to have an average useful life of

Form 5756 1-25-500 63

O.K. V Lowes.

BOSTON ELEVATED RAILWAY
POWER DEPARTMENT
REPORT ON TROLLEY WIRE BREAKS

Date 1-6-26
Street Kearny Sq. City Wash. St. North Near At Pole No. 109/33 E. Time 7.55 a.m. p.m.

POINT OF BREAK (Put (X) opposite correct location entering)		CAUSE OF BREAK (Put (X) opposite correct cause)	
Under car at leaving end		Worn wire	
Splicer	Kind	Crystallization	X
Section insulator		Flaw	
Frog	X	Burned down by	
Crossing		Pulled down by	
Other fitting		Pulled out of fitting	
In span		Old burn	

REMARKS: (In this space give full additional information which will help explain cause of break)
109/33E Cut Bd wire broken at taking end of frog Rep with 5 ft H.D. Wire 2 Drew Splice ears Clear at 8.05 Cause Vibration No body hurt

Reported by Rapson

Send all broken ends to Supt. of Wires, 536 Harrison Ave., Boston
Size of wire 2/0 Kind Std. E.E. 376 Remarks: P.V. Foote
Date installed May 10-22 Life 3 7/12 years 1,247,580 car movements. Div. 4
956 Cars per day.

Form Used to Record Location and Cause of Trolley Wire Breaks

about 250,000 trolley wheel passes. Thus there is a safe margin between the 200,000 wheel pass inspection and the limit of wear of the ears.

A double card index is kept in the office of the superintendent of wires. Each section has a card on which is recorded the daily number of car passes and the dates of all previous inspections and renewals. A dated file is also kept showing the work done each day.

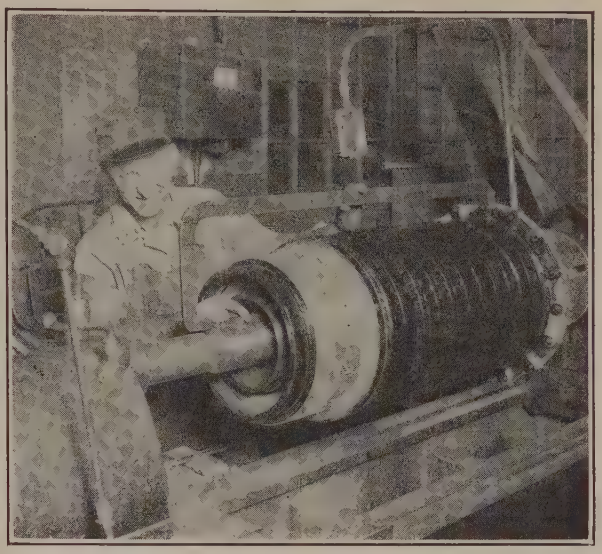
Two day crews and three night crews are employed on line maintenance work. Each crew consists of a foreman, a driver and two linemen. Four White trucks with McCardle towers are used, as well as two tower cars for work in the subway and on private right-of-way. Thus there are altogether six towers for the five crews. In addition the company has five emergency tower trucks. At times some of these in the outlying sections are used on maintenance work, but the downtown emergency is never used for any other purpose.

Compensating Armature End Play

Methods of Measuring and Compensating for Armature End Play Are Given, Together with the Solution of a Particular Problem

By Jesse M. Zimmerman
Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

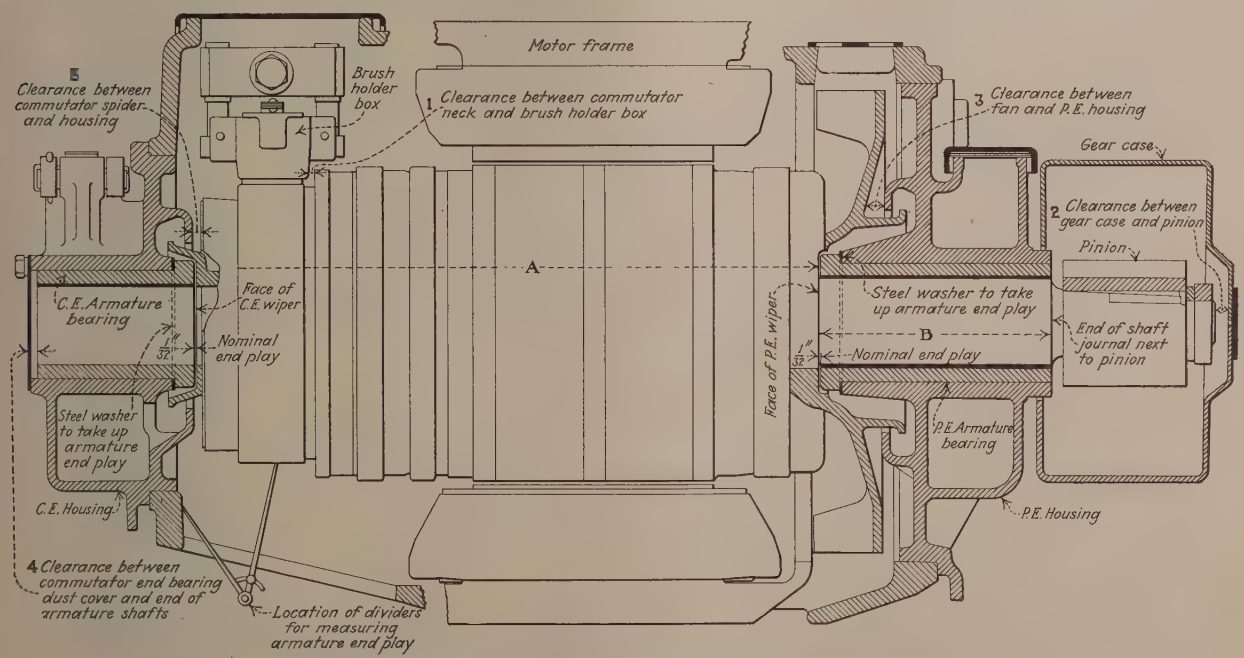
OVERHAULED motors should not be put into service if the total armature end play is less than $\frac{3}{32}$ in. or more than $\frac{5}{32}$ in. The operator by careful study of each individual motor on his property can determine the maximum end play permissible for good operation. A simple method of measuring the end play of armatures as installed in their frames consists of moving the armature so that the pinion end wiper collar is against the armature bearing flange and then to prick punch a hole in the motor frame below the commutator. The various



Measuring the Distance Between Wiper Faces of an Armature

operations can best be followed by referring to the accompanying line cut. After prick punching, one point of a pair of dividers should be placed in this hole and a mark can be scratched on the commutator face with the other point. The armature should then be slid along so that the commutator end wiper collar is against the armature bearing flange. With the point of the dividers in the prick punch hole, another line can then be scribed on the commutator face. By measuring the distance between the two scribed lines, the total armature end play will be found.

Some general figures for armature end play should be of assistance. The end play for motors using gears with $3\frac{1}{2}$ to $4\frac{1}{4}$ diametral pitch should not exceed $\frac{5}{16}$ in., and the end play for motors using gears with $2\frac{1}{2}$ to 3 diametral pitch should not exceed $\frac{1}{4}$ in. Five particular clearance conditions should be taken into account on


Motor frame
5 Clearance between commutator spider and housing
Brush holder box
1 Clearance between commutator neck and brush holder box
3 Clearance between fan and P.E. housing
Gear case
2 Clearance between gear case and pinion
Pinion
A
C.E. Armature bearing
Face of C.E. wiper
Nominal end play
Steel washer to take up armature end play
C.E. Housing
Face of P.E. wiper
Steel washer to take up armature end play
B
Nominal end play
End of shaft journal next to pinion
P.E. Armature bearing
P.E. Housing
4 Clearance between commutator end bearing dust cover and end of armature shafts
Location of dividers for measuring armature end play

Section of Railway Motor Showing How Armature End Play Can Be Determined

every motor. These are not all limiting conditions, but should be considered when arriving at the absolute maximum end play. These conditions are designated in the longitudinal drawing of the motor illustrated. The clearances are (1) between the commutator neck and brush-holder, (2) between the pinion and the gear case, (3) between the fan and pinion end housing, (4) between the commutator end bearing dust cover and the end of the armature shaft, and (5) between the commutator spider and the commutator end housing.

Steel Washers Found Useful to Take Up End Play

Fiber washers slipped over the armature shaft have been used to take up the armature end play in railway motors, but this method has not given entire satisfaction. On some properties, grit became embedded in the fiber and this caused wear at the bearing flange. In some instances, where the fiber washers had been in service for only a few months, they were badly worn or had entirely disappeared. In order to overcome the difficulty experienced with fiber washers, many operators are now using ⅛-in. thick steel washers placed over the armature bearings between the flange and the housing hub.

EXAMPLE OF METHOD USED TO CALCULATE THICKNESS OF WASHERS NECESSARY TO TAKE UP ARMATURE END PLAY

[1]	
a. Wiper distance on new armature to be	22 11/16 in.
b. Wiper distance on old armature to be	22 5/8 in.
c. Total wear on wiper faces to be	1/16 in.
d. Measured dimension B	4 17/32 in.
Dimension B received from manufacturer	4 1/2 in.
e. Wear on P.E. wiper	1/32 in.
Since the total wiper face wear found in c is	1/16 in.
and the wear on the P.E. wiper is	1/32 in.
f. The wear on the C.E. wiper will be	1/32 in.
[2]	
New C. E. armature bearing flange	3/4 in.
Old C.E. armature bearing flange	21/32 in.
Wear on C.E. armature bearing flange	3/32 in.
C.E. wiper face wear	1/32 in.
Total end wear on the C.E. of the motor	1/8 in.
Therefore, two washers should be placed over the C.E. bearing	
[3]	
As in Par. 2, P.E. bearing flange wear	1/32 in.
P.E. wiper face wear	1/32 in.
Total wear on the P.E. of the motor	1/16 in.
Therefore, one washer should be placed over the P.E. bearing.	

It is necessary to know how many washers each ⅛ in. thick are to be placed over the armature bearing before it is pressed into the housing. This can be taken care of by obtaining from the manufacturer the distance (A) between wiper faces for a new armature and the distance (B) between the pinion end wiper face and the end of the shaft journal next to the pinion. The distance between wiper faces for the armature to be used should then be determined. A convenient method of measuring the distance (A) between wiper faces of an armature was described in ELECTRIC RAILWAY JOURNAL for May 9, 1925; this method being used in the Utica Park shops of the New York State Railways. A similar method is illustrated herewith. The difference between the dimensions given by the manufacturer for a new armature and that obtained by measuring the armature to be used will be the total wear on the wiper faces. By measuring the distance (B) from the pinion end wiper face to the end of the shaft journal next to the pinion and subtracting this from the original dimension, the wear on the pinion end wiper face will be obtained. This wear on the pinion end wiper face subtracted from the total wear will give the wear on the commutator end wiper face.

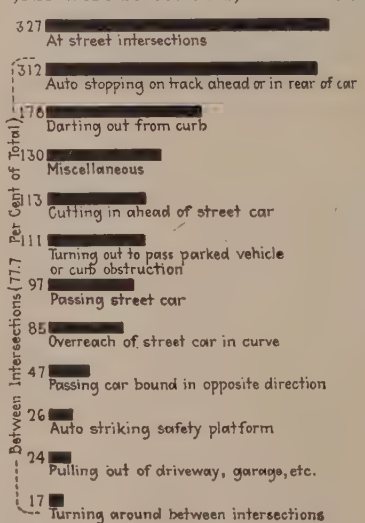
To find the wear on the commutator end bearing flange, add to this the wear on the commutator end wiper faces. This will be the thickness of the washers necessary to place over the commutator end armature bearing. The wear on the pinion end bearing flange can be found by adding to this wear the pinion end wiper face. This will be the thickness of the washers necessary to be placed over the pinion end of the armature bearing. In order to illustrate the various steps as just given, a practical example is worked out in the accompanying table.

In the example given in the table, it is not necessary to account for the allowable end play since the motor was designed for ⅛ in. total end play. Therefore, by using the design values for wiper face, end distance and bearing flange width the same end play should be obtained.

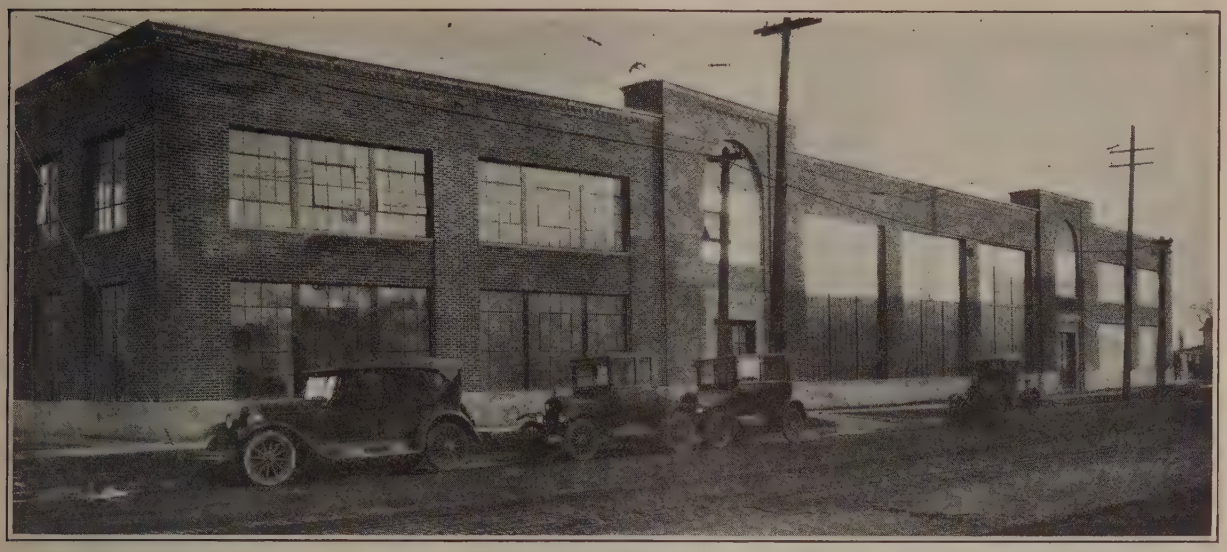
It is necessary that the bearing flange be pressed tight against the housing hub to insure sufficient end play, and in applying washers care should be taken to make sure that the commutator neck does not strike the brush-holder.

Traffic Accident Causes Analyzed at Grand Rapids

AN ANALYSIS of the causes of automobile accidents in 1925, recently issued by the department of public safety, Grand Rapids, Mich., shows that of 11,574 vehicles involved, 8,582 were private automobiles, 1,313 were street cars, 883 were heavy commercial automobiles, 210 were light commercial, 203 were automobiles of other types, 149 were bicycles, 118 were taxicabs, 58 were motorcycles and 47 were passenger buses. Altogether there were 5,996 accidents. Of this number 3,826 were collisions between motor vehicles and 1,313 were collisions between automobiles and street cars. It was found that 86 per cent of the collisions between automobiles occurred at street intersections, while 78¼ per cent of those between trolleys and automobiles occurred in the middle of the block. Pulling away from curbs, trying to get ahead of street cars through narrow spaces, stopping suddenly in front of cars or failure to notice the stopping of cars were the reasons for most of these accidents. A graphic comparison of the number of street car-automobile collisions resulting from each of these causes is given in an accompanying chart.


Between Intersections (77.7 Per Cent of Total)
327 At street intersections
312 Auto stopping on track ahead or in rear of car
176 Darting out from curb
130 Miscellaneous
113 Cutting in ahead of street car
111 Turning out to pass parked vehicle or curb obstruction
97 Passing street car
85 Overreach of street car in curve
47 Passing car bound in opposite direction
26 Auto striking safety platform
24 Pulling out of driveway, garage, etc.
17 Turning around between intersections

Causes of Collisions Between Street Cars and Automobiles in Grand Rapids



Combination Shop and Carhouse of the Aurora, Elgin & Fox River Electric Company Has a Steel Skeleton on Concrete Foundations with Brick Walls and a Wood Plank Roof

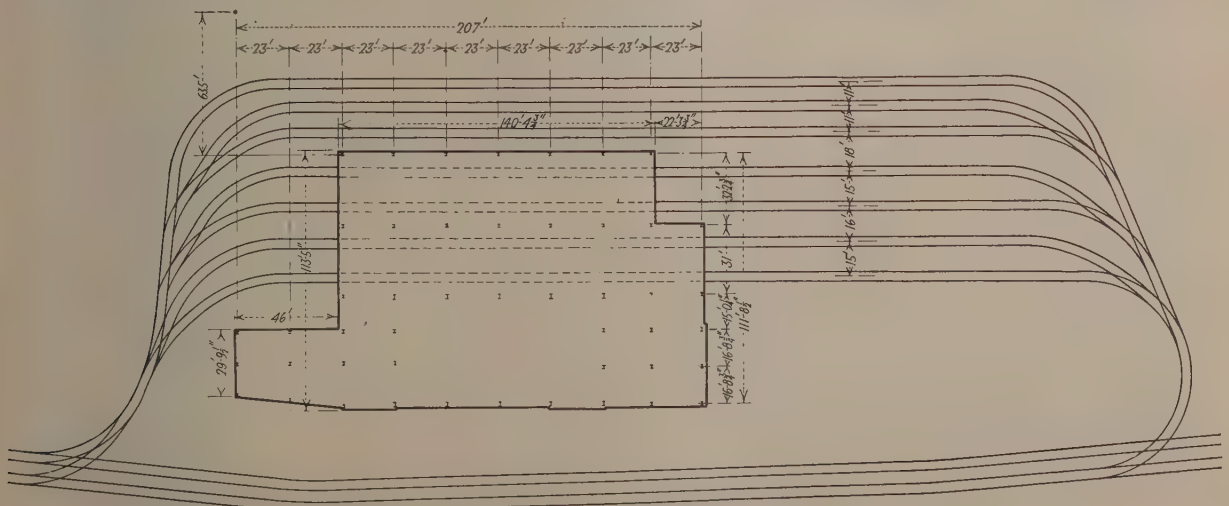
New Shops Built for Fox River Line

Roomy and Well-Lighted Structure at Aurora Is Used for All Major Repairs, Overhauling and Car Painting Work of This Railway—Machine Tools Are Provided with Individual Drive

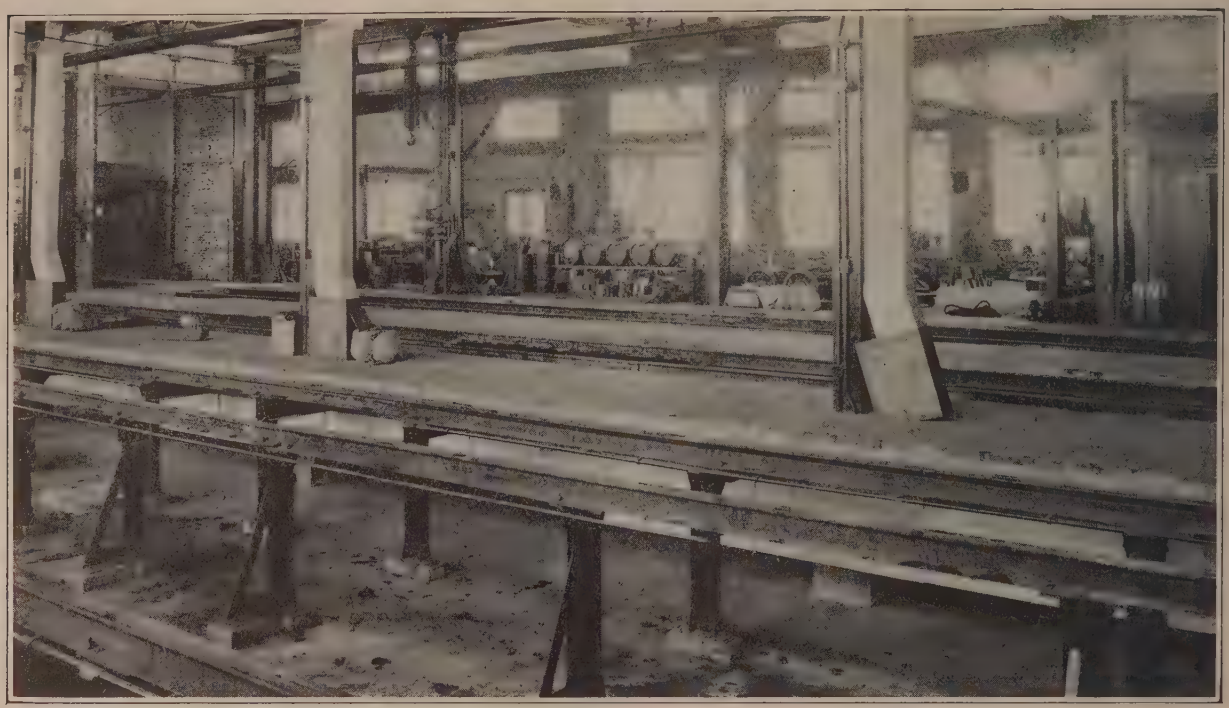
By Bruce Vernon
Division of Construction & Engineering, Stone & Webster, Inc.

CONSTRUCTION of a new bridge across the Fox River at Aurora, Ill., and a consequent change of 5 ft. in street grade recently necessitated the abandonment of the old carhouse and shops of the Aurora, Elgin & Fox River Electric Company. A new shop and carhouse was designed and constructed during 1925 by the division of construction and engineering, Stone & Webster, Inc. While the old structure was on the east bank, the site selected for the new building was on the west bank of the Fox River at River and First Streets, about ¾ mile south of the old carhouse. This change in location has resulted in giving the railway much improved facilities.

The main building is 113 ft. wide by 209 ft. long, with a two-story section at the north end 35 ft. wide by 46 ft. long which is used for trainmen's quarters. Provision has been made for the extension of the building east and south. The building is constructed with a



Track Layout and Building Arrangement of New Combination Repair Shop and Carhouse at Aurora



Flooring Has Been Omitted Between the Tracks in the Inspection Shed to Give an Unobstructed View of the Trucks and Underbodies

Materials Are Handled in the Machine Shop by a 5-Ton Electric Crane Operated from the Floor

steel frame, concrete foundations, brick walls and a wood plank roof. Floors are of concrete, except in the machine shop and carpenter shop, where wood block has been used. Flooring was omitted between the tracks in the inspection shed to allow for unobstructed view of the trucks and underbodies of the cars.

Large track doors at the north and south ends of the building are of wood, 13 ft. wide by 16 ft. high, and of the jack-knife type. Rolling steel doors are provided between the paint shop and the machine shop. Ample light is admitted through large windows with rolled steel frames on the east and west sides of the building, three sawtooth monitors in the center portion of the building and skylights over the machine shop and armature repair room.

Shops and carhouse are heated with four indirect unit heaters and the trainmen's quarters and armature repair shop by direct radiation. In addition to the floor unit heaters, a warm air heating system was installed in the pits to dry the underside of the cars during the winter season. The unit heating system has been in operation during cold weather and has proved very satisfactory. Steam for heating is supplied from a power plant near the carhouse.

The master mechanic's office is located on a mezzanine floor in the north end of the machine shop, where he has an unobstructed view of the shop and inspection shed.

The building is equipped with roof sprinklers throughout. Fire hydrants are located in the outside car storage yard. Separate toilets and locker rooms are provided for trainmen and shopmen. The locker rooms are equipped with showers. An open floor drainage system was installed, draining into sumps and covered with grating to allow for cleaning. A spray car washing system is provided for washing cars.

The main storeroom of the railway company is located across River Street from the carhouse and the shop storeroom is used for auxiliary stores.

On the west side along River Street are located the machine, blacksmith, welding and carpenter shops, with a mezzanine floor at the south end of the building for repairing of armatures and controllers. The two tracks adjacent to the machine shop are used for body and truck repairs. South of the machine shop is located the paint shop. The railway operates motor buses, which will also be painted in that shop. The two east tracks are for car inspection and washing.

Modern Equipment Provided for Machine Shop

Machine shop equipment consists of a 200-ton wheel press, a 36-in. engine lathe, a 20-in. lathe, shaper, radial drill, 24-in. drill, hacksaw, emery grinder, forge and air compressor. Provision has been made for the future installation of a wheel lathe in the machine shop near the wheel press. In the carpenter shop a rip saw and combination wood-working tool are installed. The armature shop equipment consists of a 22-in. lathe and a banding machine. Some of the equipment was removed from the old carhouse and additional equipment was purchased. Wherever possible, all tools were provided with individual drive.

Materials are handled in the machine shop by a 5-ton electric floor operated traveling crane. Air monorail hoists were provided over the tracks used for body and truck repairs for raising car bodies from the trucks. Armature and wheel changes are handled by an air pit jack mounted on flat wheels, by which they are moved to the south end of the pit, where a jib crane is used to raise them to the machine shop floor. This jib crane was also designed to swing a complete car truck from the car tracks to the wheel storage tracks. For raising armatures and controllers to the mezzanine floor an electric hoist was provided.

The carhouse was designed with track connections from River Street to each end of the carhouse. Approximately 90 cars are operated from the carhouse. The repair shop is used for all major repairs, overhauling and painting of cars from both Aurora and Elgin. Storage tracks on the east and south sides of the building are used for open storage, and for a property of the size of the Aurora, Elgin & Fox River Electric Company the open storage for cars is thought to be quite satisfactory.

Pittsburgh Railways the Big Brother of Invention

IF NECESSITY is the mother of invention, then suggestion might well be called the brother of invention. The Pittsburgh Railways is acting like a big brother to its fraternity of employees, in that it is rewarding them for bringing in suggestions. These ideas have not only proved valuable as savers of time and money, but the freedom of thought allowed has been a stimulus leading in many cases to invention of devices.

Ideas are forwarded to a department of the Philadelphia Company, of which the Pittsburgh Railways is a subsidiary, known as the suggestion department. This body encourages the making of suggestions by employees on any subject. There is a committee that reviews all suggestions after submission to department heads. It decides whether or not the suggestions should be adopted, and sets the value on the suggestion, cash prizes being granted in amounts anywhere from $5 to $75.

The way the plan works out in practice is well illustrated by the following incident, which is typical of what can be accomplished. On Jan. 21 a letter was received by the suggestion department from one of the shop men, signed "A Dynamic J.," a fictitious name, of course. But the real name was not lost sight of, nor was the idea, because a few weeks later a reply was sent, inclosing a voucher for $50.

These letters will tell the story:

Date, 1-21-26.

WILLIAM A. COYLE.
Chairman Committee on Suggestions.
DEAR SIR:

The car-wheel boring machines at Homewood Shops (P. R. Co.) have individual motor and gear drive with ordinary control equipment. When the operator wishes to shut down the machine, in order to change the tool setting, gage, the bore, or remove the work, he must wait until the table on which the wheel rests stops rotating. At present the wheel will rotate about nine revolutions after the power has been shut off. This rotation is slow and cannot be stopped by ordinary manual means, due to the great weight of the rotating table and revolving armature. Much time is lost by the operator and machine in waiting for the table to stop. This loss is considerable on account of the frequent stops which are necessary.

I would suggest that a dynamic brake be applied to the machine, to overcome this fault. This device is simple and functions in stopping the machine. It will stop the rotation of the table in less than a quarter of a revolution after throwing the switch. This is accomplished by the *dynamic braking* of the motor. The total cost of this device is estimated at less than $5 each.

In addition to saving considerable time, it has the advantage of being a safety device. Should the operator's clothes become entangled in the revolving table, the machine can be stopped before serious injury results.

This can be applied to any motor-driven machine.

Fictitious Name, A DYNAMIC J.

March 17, 1926.

INSTALLATION OF DYNAMIC BRAKE ON CAR WHEEL BORING MACHINES AT HOMEWOOD SHOP

DEAR MR. LUDWIG:

Thank you very kindly for your letter offering suggestion relative to the above subject.

The committee referred your idea to Mr. T. Fitzgerald, vice-president of the Pittsburgh Railways Company, who informs us that your idea will be adopted. It will save time and also prevent accidents.

It is a pleasure to inform you that the committee, at its last meeting, decided to give you an award of $50, voucher for which is attached.

May we have other of your ideas?

Sincerely yours,

Chairman.

MR. ALBERT J. LUDWIG,
Homewood Shop.

Copy to Personnel Department.

Leather Upholstered Seats in Regular Cars Prove Popular in Cleveland

MUCH talk about the desirability of comfortable seats caused a recent experiment on the part of the Cleveland Railway. Its standard two-car trains have a combination of cross and longitudinal seats in the motor car and all longitudinal seats in the trailer. One of these trains was stripped of all seats. After refinishing the interior, comfortable leather-upholstered, bucket type seats were installed, as shown in the views. The seats have full spring construction covered with loose padded leather seat cushions. The backs are shaped to give the sense of an individual seat.

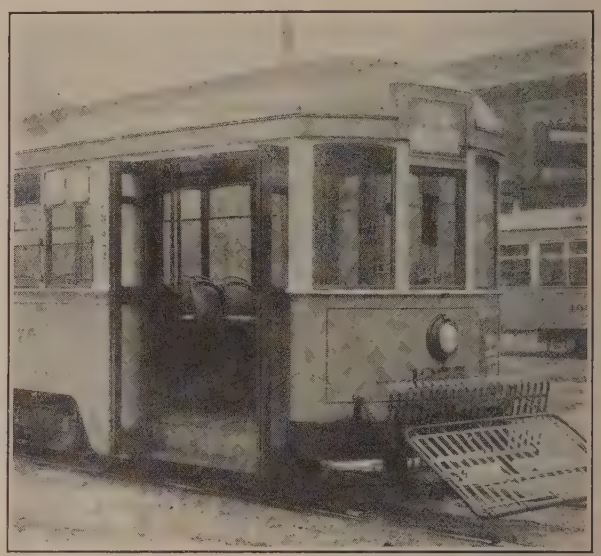
The interest shown by the public was a source of astonishment to the management. People inquire daily

Looking Forward in a Standard Trailer Used in Cleveland, Showing Seating Arrangement

of inspectors and trainmen when the car with the comfortable seats is due to pass their corner and the telephone operators at the company's switchboard frequently have calls of a similar nature.

All of the new seats face forward. In the rear of the motor car the seats are placed two and two across the car. Where more space is desirable the aisle is made wider by using only single seats on one side.

Seating capacity is not materially changed by this new plan, largely because the old trailer seating was not so very economical. In the new arrangement 48 seats replace 56 of the old type, while in the trailers 60 of the bucket type seats are used instead of 57 or 58 of the old type (depending upon the use of a stove or electric heat in winter). For the whole train only five less seats of the new type are provided, but the comfort and desirability of the seats from the ride-selling standpoint are many times as great.



The New Seats in Cleveland Experimental Train Are an Invitation to Come in and Ride

In the Cleveland Experiment with Comfortable Seats of the Luxurious Bus Type All Passengers Face the Front

Bucket Type Leather-Upholstered Seats Being Tried on One Two-Car Train of the Cleveland Railway Have Proved Very Popular

Improved Instrument for Car Operation Tests

By A. W. Swan, B.A.Sc.
Evershed & Vignoles, Ltd., London, England

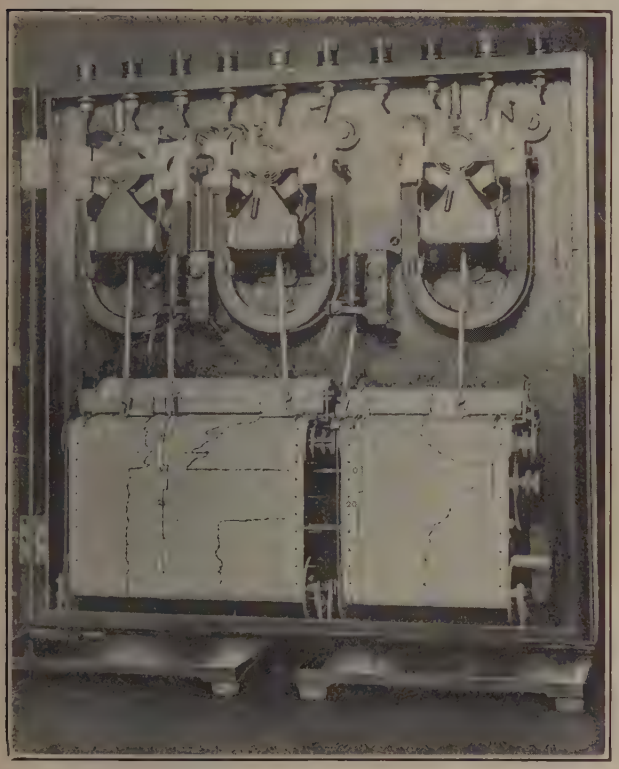
INTERRELATED records arranged side by side to show speed, current, volts, stopping time, and brake applications are particularly desirable to electric railway test engineers. To supply this need a comprehensive instrument, called the traction recorder, has been placed on the market by Evershed & Vignoles, Ltd., London, England. A short description of this instrument was published in ELECTRIC RAILWAY JOURNAL for March 7, 1925. Since that time, however, a number of improvements have been made as the result of the practical use of this instrument, particularly in tests made by the Metropolitan Railway, London.

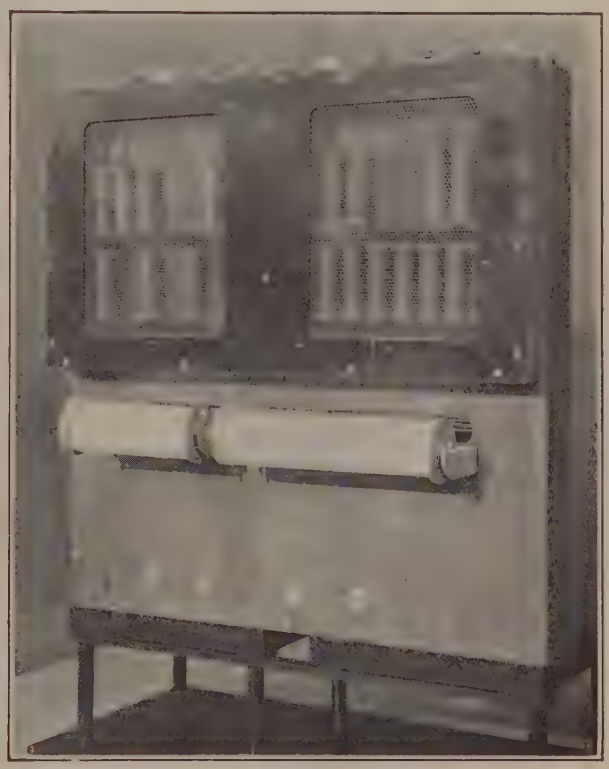
The recorder shown herewith was designed specifically for use on electric railways which employ direct current. The design, however, can be readily modified for use on either single-phase or three-phase systems. For electric railways using alternating current, records would be shown for current, voltage, and power relating to true kilowatts, wattless component, power factor, etc. The instrument is portable and can be transferred readily from one location to another. However, to insure steady recording when a car or train is traveling at high speed it is necessary to have the instrument fixed in some semi-permanent position.

The traction recorder, as improved, charts five individual records. These are: (1) Line voltage; (2) station stops; (3) total current; (4) brake applications; (5) speed in miles per hour. All records are in perfect synchronism, so that the charts are readily comparable. The time lines are straight, so that the values of current, voltage and speed at any particular instant can be compared readily. Particular attention has been given to produce an instrument which is not affected by train vibration or by external electrical and magnetic forces. Accuracy of the records produced has been considered as of greatest importance.

The recorder as arranged for direct-current railways is 20 in. x 20 in. x 8 in. in size and can be mounted in any convenient location in an electric car or locomotive. An accompanying illustration shows the instrument. It will be seen that the five records are produced on two rolls of cross-section paper. These are driven in synchronism and the perforations along the edge are arranged so that the records readily can be lined up for comparison. The individual records are produced by five pens which hang vertically from their supporting mechanism.

The records shown in the illustration, reading from left to right, are: Voltage, brake applications, current, station stops, and speed. The pens recording brake applications and station stops are operated by small electro-magnetic movements, while the three pens recording speed, current and voltage are controlled by instrument movements of the Evershed moving coil, moving iron, dynamometer, or ratiometer type, suitably shielded from external magnetic fields.

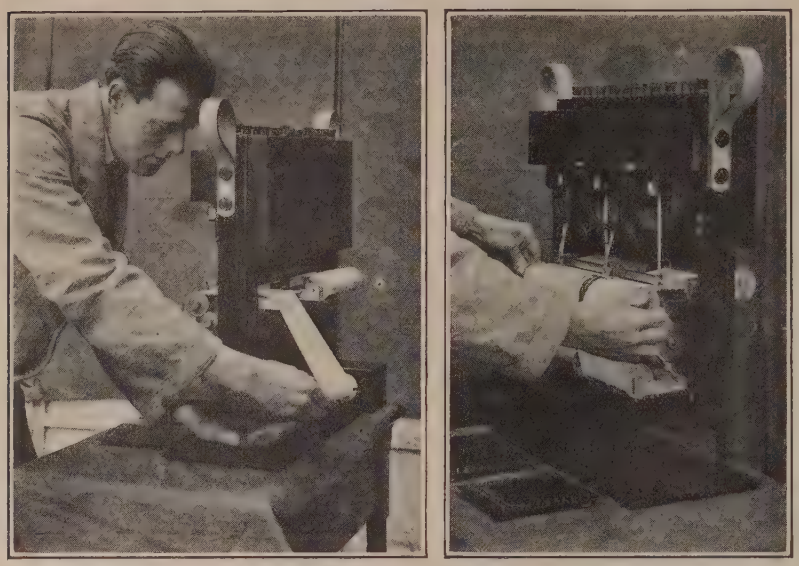




Front and Rear Views of Traction Recorder, as Arranged to Provide Five Simultaneous Records

The pens are designed to trace their records on a horizontal surface, and they are therefore always in contact with the chart paper even when the train is passing over switches or around curves. In order to minimize the effect of train vibration, the movements are balanced and heavily damped. Special non-spilling dashpots are also provided.

The success in neutralizing the effect of train vibration may be seen from a study of the chart reproduced herewith, which is a small section of a record taken by



Attaching the End of a Used Chart to a New Roll for Continuing the Record

engineers of the Metropolitan Railway, London. Recording on a chart 3½ in. wide, the maximum error due to train vibration was less than 1/64 in. when the train was traveling at 73 m.p.h. through a junction and over crossovers.

The chart speed can be varied from 1 in. to 12 in. per minute by changing the driving gears. The chart reproduced was made at a chart speed of 3 in. per minute, and the section reproduced is for a run between Neasden and Kilburn. This particular section was selected in order to show several short runs and not to illustrate characteristics of train operation or schedule requirements. The vertical lines on the original chart are 1 in. apart, and as the roll for this particular test was moving 3 in. per minute, the vertical lines represent time intervals of twenty seconds. These have been reduced in the illustration. The train on which this record was taken was a local, made up of two motor coaches and five trailers.

In the test referred to, one-half of the passenger space inside a motor car was fitted out as a testing compartment, a temporary wooden partition being placed across the car. The recorder was attached to the partition, and also rested on a table which was used for convenience of the operating staff. In addition to the recorder, a portable ammeter and voltmeter were used to take readings from time to time as a check on the figures of the recorder. An air gage and mechanism for controlling the brake record also were provided. Spare parts and other testing accessories, such as stop watches, log books, etc., were carried in two drawers fitted to the table. The speed record was obtained electrically from a small generator driven by one of the car axles. In order to compensate for different wheel diameters, as might be caused by wear, a wheel diameter compensator was used.

Provision is made so that a chart can be renewed without stopping the instrument. A spool of unused charts is carried on brackets mounted outside the back of the instrument. This can be fed through a slot. When it is seen that the used chart is nearing its end, it is unrolled and passed under the instrument, where it is pasted to the new roll. The new roll is then passed back under the instrument and put into the regular bracket. In order to insure that the registration of the double-peg drive is continuous, the joining of the two rolls is made on a special board with pegs on both sides corresponding to the actual drive. With such a board, the operation of pasting together the two ends can be done very accurately and quickly.

Another improvement consists of a prolonged metal surface underneath the chart. This permits making pencil notes on the records as the instrument is running. Loose flanges are also provided on the bottom spool, so that the paper can be slipped off quickly.

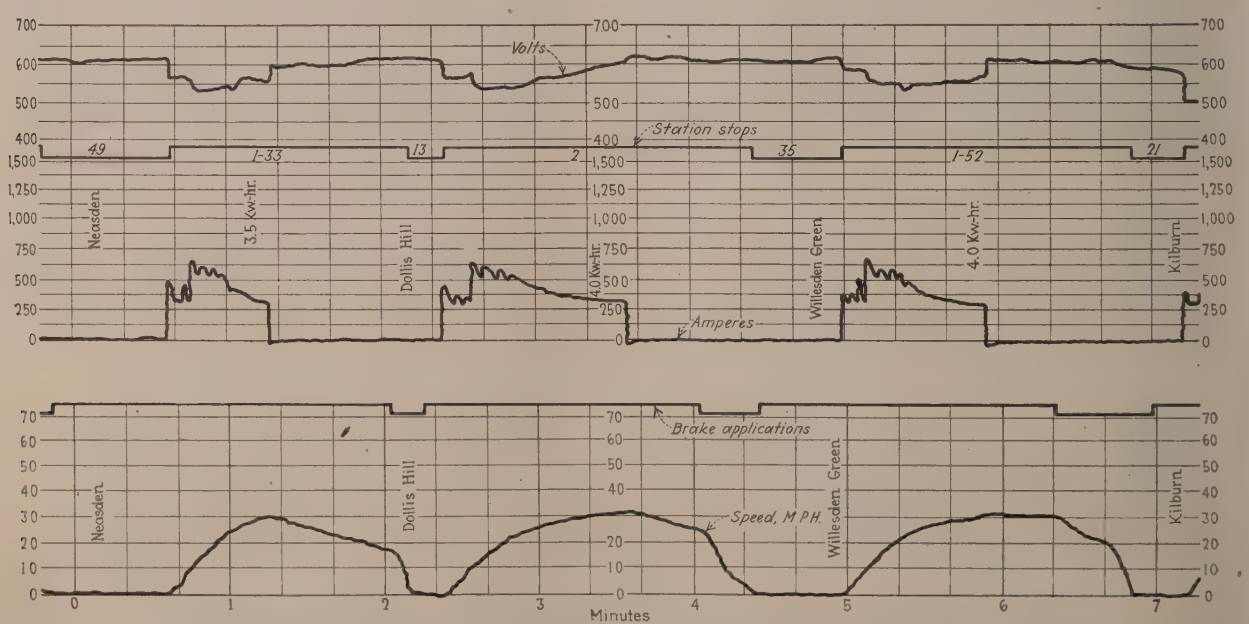


Chart Record of a Small Section of a Run Made on the Lines of the Metropolitan Railway, London

Dick Prescott Sees the Boss

and Makes a Recommendation

DICK PRESCOTT, engineer of equipment of the Consolidated Railway & Light Company, and his friend Steve White, the carpenter shop foreman, spent several busy evenings discussing the maintenance of old cars and preparing estimates on the costs for the various types of cars in service on the property. They were seriously handicapped by the lack of operating and maintenance cost records for different groups of cars. They did manage, however, to make up estimates for the older groups in comparison with cars bought in recent years. Their primary purpose was to find whether the expensive reconstruction work that was being carried out in the shop on the old equipment was justified.

When they had put their figures together Steve and Dick decided to lay them before Thomas Mullaney, general foreman.

Under the changed conditions in the Consolidated organization they felt sure the boss would welcome their suggestions and would give them a hearing. This was indeed a new order of things in the shop. A year before no one would have dared make such a report to Mullaney. But the word had gone down the line that the property was being operated to make money and not to save it. Along with this had gone the idea that the only way to make money was to make the company's service worth money—enough money to show a profit at the end of the year. Department heads who had formerly been under constant pressure to hold down their expenses were now being pushed for new suggestions on how to improve the company's service with a view toward building riding on its cars and making its patrons into friends and boosters.

Mullaney was an entirely changed man under the new conditions. The old defensive hard shell with which he had formerly protected the precedents of past years was almost entirely gone as the result of the need for stimulating interest and constructive thinking among the members of the shop staff.

When Dick and Steve entered his office, Mullaney looked up with a twinkle of interest in his eyes as he inquired the purpose of their visit in his usual gruff manner.

"Well, what have you fellows got on your mind now?" he asked.

"Steve and I have been doing some figuring during the past week or so," replied Dick, "and we've got some information put together here that we think you will want to have."

"Figuring about what?" queried Mullaney.

"Car maintenance costs," replied Dick.

"What do you fellows need to be figuring on that for? I've got all the records right here from the auditor."

"We realize that, Mr. Mullaney. We haven't been fooling with maintenance costs per car mile for the department. That's a matter of checking total expenditures and determining the total amounts spent for labor, material and other principal items. We've been trying to get at a comparison between the different types of equipment."

"Well, I don't even see what you've got to do there. I've got mileage records on armature rewinds, pull-ins, bearings, gears, wheels and other items. We keep figures on oil consumption, glass, trolley wheels and lots of other things. We know more about those items right here in the office than you men could ever dig out in a year."

"That's true, Mr. Mullaney, but what we were after was the comparison of different types of equipment."

"All right, we've got that too. We've made tests right along to check up on how each manufacturer's stuff stands up, particularly when we get anything new to try out."

"Yes, I'm following all those records in the engineering department, Mr. Mullaney, and I am also carrying some of those tests further. But Steve and I have been going after another and a very important side of this story. We're trying to get a comparison between the total operating and maintenance costs on some of the older equipment, like the group of 200 class cars for example, and on the newer light-weight cars that we put in service several years ago. We've tried to find out whether or not it would be better to scrap the old 200s and buy new cars with modern improvements than to spend $2,200 apiece on them for rebuilding, as we're doing right now."

"Oh, that's what you fellows are driving at, eh? Well, what have you got?"

"We've got some estimates that look very interesting," said Dick, as he handed Mullaney a copy of the report that he and Steve had prepared.

Mullaney glanced through the report, while Dick and Steve sat by in silence.

"Huh!" he finally exclaimed. "You think we ought to get rid of the 200s instead of rebuilding them, and buy some new cars in place of them?"

"It looks very much that way," answered Dick.

"That sounds all right, but where do you think we're goin' to get the money?"

Dick was ready for the question. "The amount we're spending on the 200s right now is more than half the first payment cost on the same number of new cars," he responded. "We figured that it would only be necessary to raise as much more as we're now spending, and that the saving in operating and maintenance alone would more than pay off the entire cost of the cars."

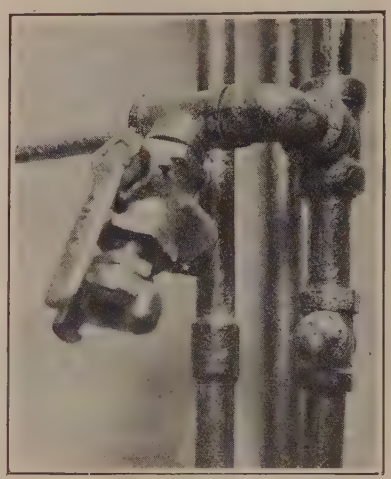
"If that's so," replied Mullaney, "it looks to me as though you fellows had something here that we ought to be thinking about. How did you get at your figures?"

Maintenance Notes

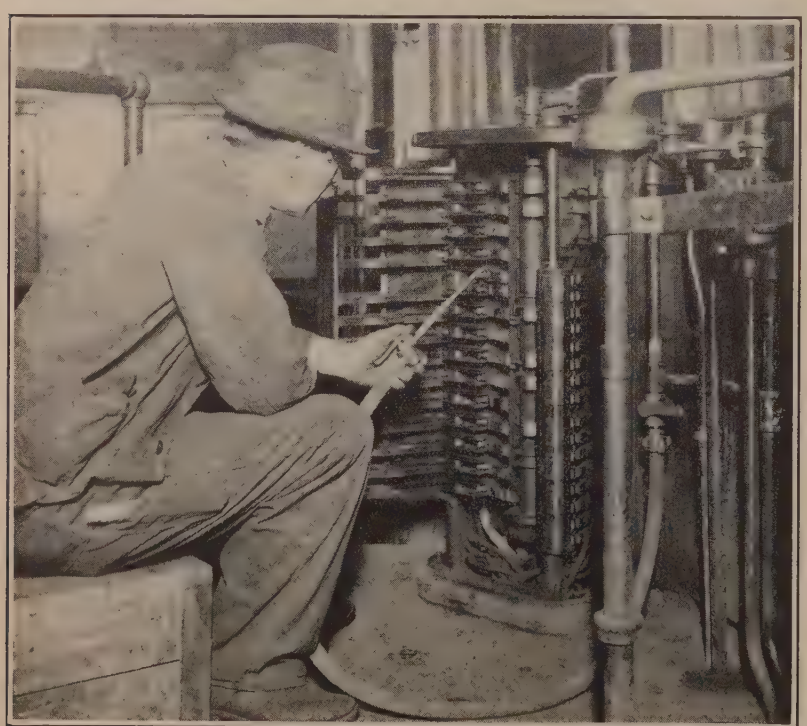
Convenient Attachment for Blowing Out Controllers

CLEANING and blowing out controllers is considered a most essential part of the inspection of car equipment in the shops of the Department of Street Railways, Detroit, Mich. To provide a convenient method for attaching the air hose and also to eliminate the necessity of having the workman handle a long line of hose for this work, each car has been equipped with a shut-off valve in the main reservoir line alongside each controller. These valves and the end of the hose are provided with Universal air hose couplings, so that the hose can be attached very quickly.

To blow out a controller, the workman attaches a length of approximately 5 ft. of hose to the coupling alongside the controller. This hose has a special fitting at the end, with a long tapering nozzle, so that the air can be directed in an effective manner. The nozzle is also provided with a valve so that the air supply can be regulated as it is used. The accompanying illustrations show the hose attached and nozzle for blowing out a controller, and also a close-up view of the Universal fitting for attaching the hose.



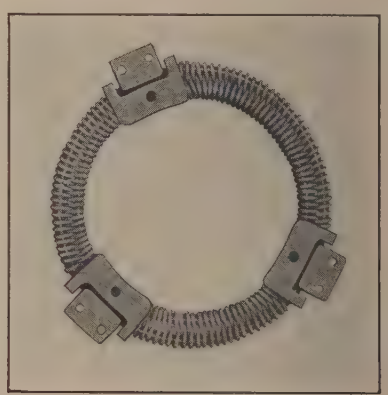
Close-Up View of the Air Valve and Universal Fitting for Attaching Hose to Blow Out Controllers



Removing Carbonization and Dust from a Controller by Air Blast on One of the Cars of the Department of Street Railways, Detroit, Mich.

Rope-Laced Compressor Suspension Used

NOISE of air compressors has been reduced by a special suspension in a trial made by the Buffalo & Erie Railway, Fredonia, N. Y. This suspension, which consists of two circular rods laced together with specially treated trolley rope, has reduced the noise of compressors transmitted to the car body about 80 per cent. The type of compressor suspension illustrated is for the General Electric Company's type CP 27-S compressor. The suspension consists of two circular 1-in. rods with supporting lugs welded



A Noiseproof Compressor Suspension Is Obtained by Lacing Two Rings Together with Trolley Rope, the Inner One Serving as a Support for the Compressor, While the Outer Ring Is Fastened to the Car

onto them. The outer ring has three lugs which bolt to the car body. The inner ring has three lugs which bolt to the compressor housing. Safety lugs are also provided on the center ring at each point of support which extend out over the outside ring with sufficient space between them and the ring to allow for the rope lacing.

The two rings are laced together tightly with ordinary trolley rope which is treated with linseed oil and paraffin, so that it will not deteriorate from exposure to the weather. Before the rope is attached, the rods are taped so as to do away with any tendency to cut the rope from contact with the rod. With this type of suspension, the air connections to

the compressor are made through rubber hose.

The management of the road states that the flexible compressor suspension eliminates almost entirely the more pronounced and objectionable noises created by the running of the compressor. These were most objectionable when the car was running at low speed or standing still. The effect of the improvement has a decided bearing on passengers and their general comfort, aside from the elimination of noise in the moving equipment on the highway.

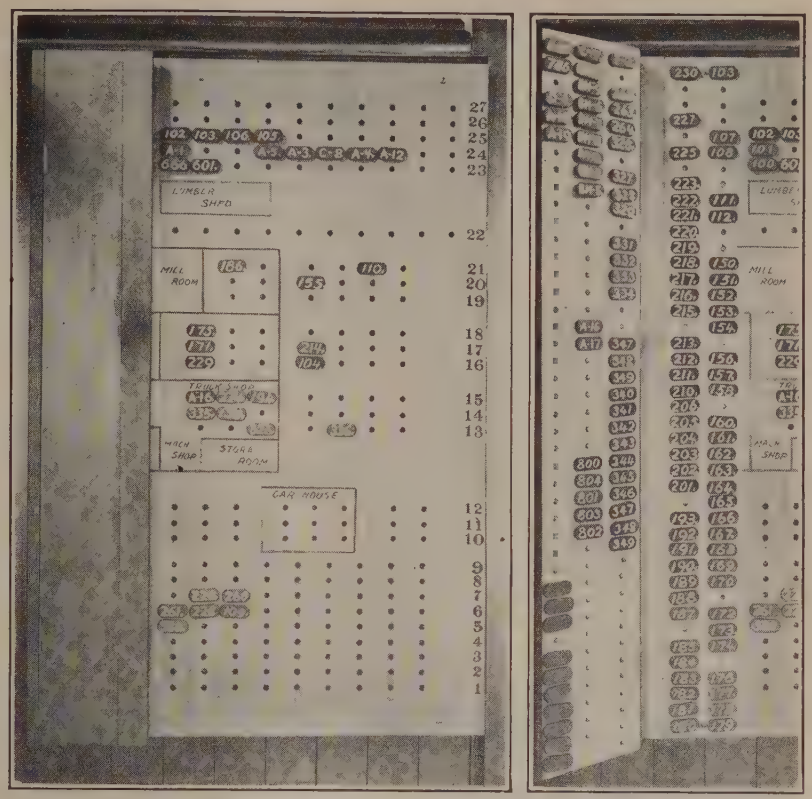
Dust Washed from Air After Cleaning Armatures

MANY electric railway shops are provided with special facilities for blowing the dust from armatures and other electrical equipment preparatory to rewinding or repairing. The Los Angeles Railway, Los Angeles, Cal., however, has added another improvement in that the air as it is drawn out from the cleaning compartment passes through a tank containing an arrangement of pipes for spraying water. This washes the air clean before it is once more returned to the outdoors.

The equipment provided in the Los Angeles shop consists of a special compartment in which armatures, motors and like equipment are cleaned. The electric parts are suspended from an iron rod and the compartment is completely closed except for a small aperture through which the cleaning nozzle is inserted. Air and dust after removal from the equipment are drawn out by an exhaust fan.

Board Shows Location of Cars

DIRECTLY in front of the desk of the superintendent of equipment of the Erie Railways, Erie, Pa., is a large board arranged to show the location of all cars which are in the shops or adjacent storage yards. This board is made up twice a day, so as to make certain that it represents conditions as they change. It consists essentially of a layout of the shop and tracks, with holes arranged at the correct intervals along the center lines of the tracks so that small wooden blocks can be inserted to represent the cars. These blocks have car numbers painted on them, so that when the board is made up it shows the location and number of each car. The tracks are numbered from 1 to 27, beginning at the bottom of the board. The first nine tracks are in the storage yards. Tracks 10, 11 and 12 go through the carhouse, tracks 13, 14 and 15 into the truck shop, 16, 17 and 18 into the carpenter shop, 19, 20 and 21 into the paint shop; track 22 is between the paint shop and lumber shed, and tracks 23, 24, 25, 26 and 27 in the yard adjacent to the lumber shed. The left-hand edge of the board has a hinged cover with space for keeping the blocks representing cars which are in service or at other points of the system. The board is 44 in. high and 30 in. wide. The left-hand side door is 7 in. wide.



This Board Has Been Found Particularly Convenient for Keeping the Master Mechanic Informed as to the Location of Cars in the Shop
At left, board as it appears normally. At right, with hinged cover open.

Painting Destination Signs with Roller and Mask

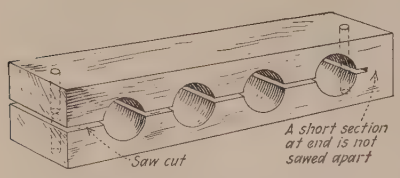
NOT long ago an acknowledged expert in the painting of destination signs by the spray process challenged one of the International Railway (Buffalo, N. Y.) sign painters, who favored the roller and mask method, to a race. The latter won a decisive victory, as he was able to turn out the curtains at a normal rate of one every five minutes and, furthermore, the finished product was a thing of neatness and beauty, which could not be said for the product of the challenger.

The I. R. C. method is to place a mask on the linen curtain, which is Sun-Fast Holland heavy linen, then after tacking the curtain and mask firmly in position, the inked roller is passed back and forth across the whole until the entire curtain is completed. Roller signs of indefinite length may be made in this fashion, as the completed portions are simply moved on out of the way and further sections inked.

Impregnated Motor Cleats Prevent Short Circuits

CLEATS for holding motor leads are commonly made of hard wood. When these become water soaked the insulation resistance between leads is decreased considerably and sometimes short circuits result. The wood also rots quickly.

To keep water out of such cleats the Department of Street Railways, Detroit, drys out the new cleats in a baking oven and, while still hot, soaks them in linseed oil. Increased life and decreased trouble have resulted. In making the cleats, holes



Hard Wood Motor Lead Cleats Are Impregnated to Keep Out Moisture in Detroit

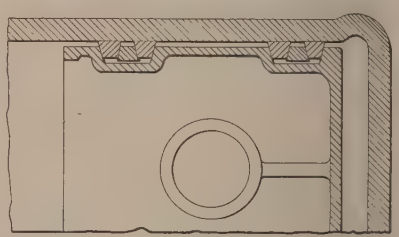
are drilled of proper size to fit the leads. The blocks are then sawed through the center line of the holes. A short section at the end is left unsawed so that the two parts are kept together until ready for installation.

Disk Grinding of Motorman's Valves Saves Time

FOR grinding in motorman's valves, the Erie Railways, Erie, Pa., makes use of a cast iron disk ¾ in. thick by 12 in. diameter, attached to a compressor motor. When grinding valves a carborundum paste is spread over the valve seat, which is then held against the side of the rotating disk. This method has proved entirely satisfactory and the time and the labor of grinding have been reduced enormously.

Bus Engine Piston with New Type Rings

PISTON rings of the conventional type used with automotive equipment are of one piece, step-cut, and are placed in a straight groove. With the ordinary type of piston, the cylinder walls, after long usage, become worn out of round, because the pressure of the connecting rods caused by the rapid revolving of the crankshaft forces the pistons against the cylinder walls. The piston rings, too, wear thinner, and as they do they become weaker, losing their pressure against the cylinder wall. In addition, the grooves wear also, so that sooner or later the motor develops what is known as "piston slap" and becomes noisy. Because of the loose-fitting rings, power is diminished and gas and oil consumption increase rapidly. Heretofore the only effective remedy for such trouble has been to take the motor down and send the block to a regrinding shop, where the cylinders are rebored and fitted with oversize pistons and rings. This method is expensive



A Three-Piece Ring Guides the Piston and Eliminates Slap

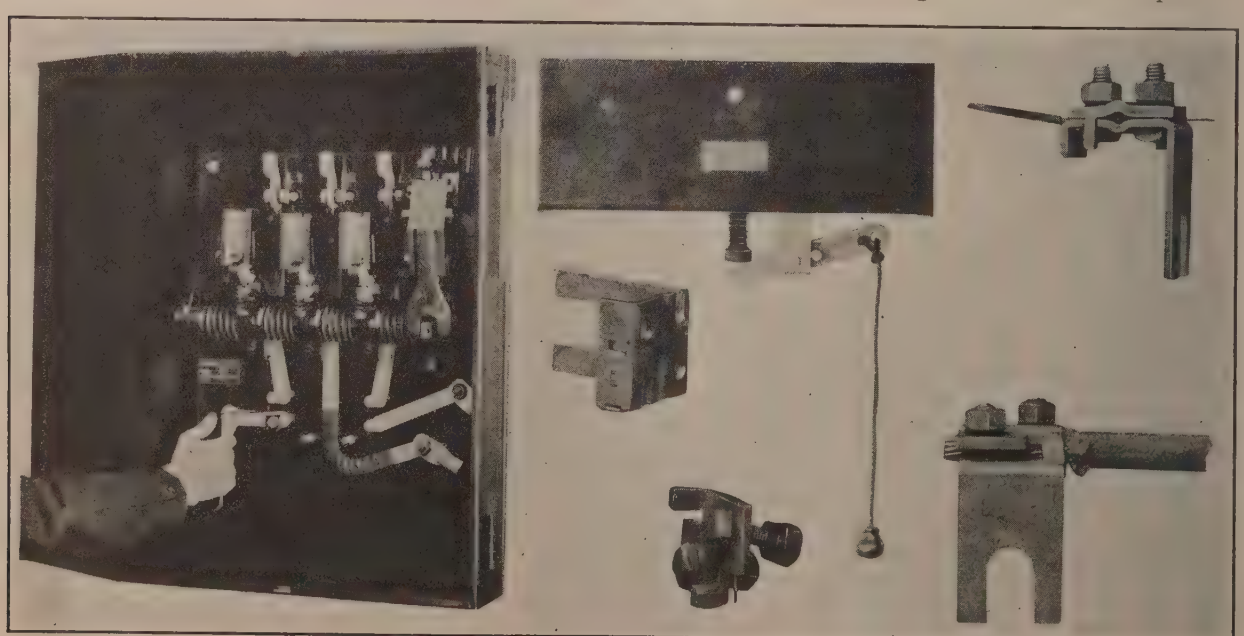
New Equipment Available

Improved Control Accessories Facilitate Installation

RECENT control devices marketed by the General Electric Company, Schenectady, N. Y., include a resistor terminal, an external relay reset, a relay installing wrench and a relay mounting panel. With the exception of the resistor terminal, the new equipment is designed to facilitate the use of temperature overload relays. The improved terminal simplifies installation of resistors. Only one size is needed for all currents up to 225 amp. Soldering is unnecessary to secure stranded cable and the mechanical construction is improved so that changing taps is simplified.

For use with those control installations where starters do not incorporate temperature overload relays, temperature overload protection may now be secured by using a new design of auxiliary panel on which a temperature overload relay may be mounted. It is equipped with a novel resetting feature, which allows external resetting by means of a cord.

A special installing wrench for mounting relays in those panels and switches which do not contain them has been designed and is delivered as part of the control equipment with which they are needed. With this wrench the danger of damage to the thermostatic strips while installing is minimized.



At Left, Relay Installing Wrench. At Top, Center, External Resetting Device. At Right, New Terminal for Resistors

and at best is only temporary, for in the majority of cases there is a recurrence of the old troubles.

To provide a remedy for such conditions experiments have been conducted and the "Anti-Slap" piston with specially designed rings has been developed by the Anti-Slap Piston Company, Rahway, N. J. This piston has two beveled-edge grooves, one near the top and one in the skirt. Each groove is fitted with a three-piece ring, two pieces of which bear against the cylinder wall. The outer rings are beveled on both sides, to fit against the beveled groove in the piston and the bevel of the center ring. The wall pressure of the outside rings is small, but the outward pressure in the center ring forces them against the beveled edges of the groove in the piston and against the cylinder wall.

The center ring does not come in contact with the cylinder wall, does

Piston with Specially Designed Rings

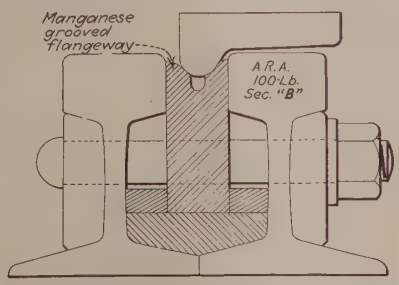
not wear away and constantly retains its pressure. The break in the center ring is at right angles to those of the outer rings. This causes the inner ring to exert its greatest pressure against the outer rings at their joints, forcing the outside rings to conform to the cylinder bore and have a tight bearing against the beveled edges of the piston grooves. This action of the rings guides the piston and eliminates piston slap.

With the use of "Anti-Slap" pistons it is claimed motors will run more quietly and smoothly; oil cannot work past the rings to foul the spark plugs, thus reducing oil consumption; gasoline consumption is reduced because of the more tightly fitting rings and more power is obtained, making the engine more efficient in its operation.

Track Crossing Has Manganese Filler

SPECIALLY designed for surface street car lines, the Wiswell improved crossing embodies an ordinary built-up rail crossing to which certain patented improvements have been added. These consist of a cast manganese filler and grooved flangeway said to eliminate all jumps and pounding at intersections.

It is claimed that all wear on the extreme tip of the wheel flange is eliminated by means of the U-shaped groove which is shown in the accompanying illustration. The wheels are



Flange Bears Evenly on U-Groove

carried in the saddle of the flangeway and ample bearing is provided on both sides of the flange, allowing no weight whatever to come on the point or tip. The U-groove shown at the bottom of the flangeway protects the edge of the wheel from being chipped or broken, according to the manufacturer.

With the usual single point bearing, where the wheel bears on the extreme tip of the flange the top of the flangeway is rapidly cut down where chilled cast-iron wheels are used. Where cast-steel wheels are used the flange itself becomes flattened, and as a result the special work may become badly pounded. It is claimed for the Wiswell crossing that the absence of movable parts and the ease of replacement of the manganese flangeway reduce maintenance work to a minimum.

When the flangeway is worn down $\frac{1}{8}$ in., it is stated that this can be raised by simply removing the bolt and placing a $\frac{1}{8}$-in. liner between the bolster and the flangeway. This process may be repeated several times. Where surface line rails are imbedded in concrete, this replacement can be made with no disturbance to the rail proper and thus lends itself to economy of maintenance. The crossing inclines upward $\frac{1}{4}$ in. from a distance of about 2 ft. from the rail crossing proper in order to raise the wheel tread clear of the stock rail at the intersection. Over this point the flange of the wheel is carried in the saddle of the flangeway, as shown in the illustration. The manganese flangeway has been arranged to rest upon a chemically treated wood cushion attached to a steel shoe, thus giving elasticity to the crossing, a useful feature where the rails are imbedded in concrete.

One-Piece, Dustproof Meter Case

MAHOGANY-VENEER finish is used on a one-piece Micarta meter case designed by the Westinghouse Electric & Manufacturing Company for standard watt-hour meters. This case is strong, resists acids and is dustproof. A tightly fitting nickel-plated brass ring lined with felt prevents any dust from entering the box once the meter is

One-Piece Mahogany-Veneered Case for Watt-Hour Meters with Dustproof Ring and One-Piece Construction

inserted. As a protection to the meter when it is not in use, a lid of the same finish as the box itself is provided.

The handle on this portable case is made of flexible leather and is attached to nickel-plated brass lugs, so that if damaged or broken it can be replaced easily and quickly. Provision is made for plenty of room to grip the handle without cramping the hand or fingers.

Association News & Discussions

Relieving Traffic Congestion

United States Chamber of Commerce Discusses Practical Methods to Make the Capacity of the Streets Greater and Move Traffic Faster

CONGESTION of traffic on city streets and highways was the principal topic discussed by the transportation and communication group of the United States Chamber of Commerce at Washington, D. C., on May 11. The meeting was presided over by A. L. Humphrey, president Westinghouse Air Brake Company.

Elliott H. Goodwin, resident vice-president of the Chamber of Commerce, pointed out the main results attained by the National Conference on Street and Highway Safety. Eight major subjects were considered by that body, viz.: (a) Traffic laws and regulations; (b) enforcement of laws and regulations; (c) education; (d) statistics; (e) study of causes of accidents; (f) design and maintenance of motor vehicles; (g) street and highway traffic facilities; (h) elimination and protection of grade crossings.

The National Chamber, he said, has undertaken to further particularly action as recommended by the safety conference under topics (a) and (g). It is particularly appropriate that in considering measures for dealing with the city traffic problem this body should urge the co-operation of local commercial organizations and trade associations concerned with the traffic problem to take up their share of the burden of applying, so far as practicable, in their local communities or through their lines of industry the plans and suggestions for dealing with the traffic problem as developed through the National Conference.

MR. COATES URGES CO-ORDINATION

Co-ordination of transportation facilities as an aid to the solution of the traffic problem was urged by Frank R. Coates, president American Electric Railway Association. An abstract of his paper appears elsewhere.

The rôle that the automobile industry and the automotive trade can play in connection with the traffic problem was discussed by Capt. E. V. Rickenbacker, vice-president Rickenbacker Motor Car Company, Detroit, and member of the traffic planning and safety committee of the National Automobile Chamber of Commerce. A certain proportion of highway accidents are due to operation of motor vehicles by the criminally careless, by defectives and by intoxicated persons. These cases are amenable to police discipline. A large part of the accidents, however, are due to congestion in traffic, which leads to the confusion of the driver, and to delays, which lead to subsequent unwarranted hurrying, which produces nerve strain. In this respect, the accident problem is simply a symptom of inadequate management of our traffic facilities. No one group is to blame.

Street capacity can be increased 25 per cent or more, in the opinion of the speaker, by adjusting the number of traffic lanes to the volume of traffic in either direction. For instance, in New York on Fifth Avenue, of the four lanes three are used for uptown traffic in the afternoon and the remaining one is ample for the towntown traffic at that time of day. The plan is not applicable to streets with car tracks, but can be used on through boulevards.

Parking is necessarily a local problem. The automobile trade, said Captain Rickenbacker, does not want to advocate unlimited parking. In fact, "unlimited parking" is necessarily a misnomer in crowded sections because it merely means that he who gets there first utilizes that space to the exclusion of others. Decentralization will help, as there will be less need for family motor travel downtown. When the volume of vehicles in any location becomes so extensive as to make it clear that parking is a trespass on the public convenience, in such situations it will be forbidden or limited.

If every shipper over the highways, if every merchant, if every one in the automobile business, realized the dollars and cents cost of traffic delays, we should move much more rapidly toward solution than is being done at present. Routing traffic on less frequented streets will remove an unnecessary burden on commerce and ultimately on the general consumer. Railroad freight terminals in the heart of the city, as well as loading and unloading of vehicles at the sidewalk curb, will soon disappear. Particularly will the backing up of vehicles to unload at the sidewalk have to be stopped.

Traffic Control Is Essential*

Unrestricted Parking Has Become Such an Evil that It Must Be Curbed if Streets Are to Serve Best—Electric Railways and Local Chambers of Commerce Can Co-operate to Improve Conditions

BY FRANK R. COATES
Vice-President Henry L. Doherty & Company
President American Electric Railway Association

TRAFFIC on our streets and highways has increased to such an extent that its proper control presents a problem that challenges the best minds in the nation. It is my privilege to be president of the American Electric Railway Association, and to represent the electric railways at this meeting. There is no industry more vitally interested in traffic problems than ours. The electric railways are operating 80,000 street cars and about 6,500 buses on the streets and highways. They are carrying more than 15,000,000,000 passengers per annum —more than 40,000,000 passengers per day. These passengers are the masses of the people.

There is no conflict of opinion between electric railways and the automotive industry as to the seriousness of the traffic situation, nor any conflict between us and the communities we serve, nor any conflict between us and the steam railroads. I think it is a correct statement that we are agreed that the city traffic problem exists and that it must be solved, or the tremendous losses which were pointed out in the reports of the National Conference on Street and Highway Safety will grow with appalling rapidity. Something more than dollars and cents is involved. The prosperity of the nation, the safety of the public are what concern us most.

AUTOMOBILE NOT FORESEEN

How did this problem arise? It has been only a few years in developing; how does it happen that it now presents a national emergency? The answer is plain. It came about because our forefathers, even the preceding generation, could not foresee the development of the automobile and therefore could not make provision for its demands on street and highway space. Most of our cities were laid out 50, 100 or more years ago. Those who laid them out knew of no kind of highway transportation except horse-drawn vehicles. The electric car, which followed the horse car, had been operating 30 years before the streets were crowded. But about ten years ago street congestion began to attract attention. The automobile was coming into its own. It brought about a demand not only for smoother highways, but for wider ones, for the curbs were being lined with cars.

The thrusting of 20,000,000 unanticipated automotive vehicles into cities and towns which had been laid out and built up by generations which knew only horse-drawn traffic has brought about the terrific congestion which we are now striving to relieve.

*Abstract of a paper before the Transportation and Communications Group, annual convention of the Chamber of Commerce of the United States, Washington, D. C., May 11, 1926.

The coming of the automobile has not been an unmixed blessing to city dwellers, for it has brought heavy demands upon the pocketbooks of the taxpayers, who are called upon to widen streets and highways, to provide traffic control systems, to increase the police force and, unfortunately, to see to it that there are ample accommodations and adequate staffs of surgeons and nurses in the public hospitals. Despite all this the advantages of the automobile to those who can afford them are self-evident, and I believe that the number of automotive vehicles of all kinds will increase for some time to come.

Assuming that there is to be a still greater volume of traffic on the streets and highways, is it not time for the nation to take cognizance of the situation and begin to provide not only regulation and control, but facilities for the future? Is it not time for every growing community to make a transportation plan?

You are going to have street cars for many years to come; you are going to have more buses; you are going to have more private automobiles. The street cars in the medium and larger cities are carrying more and more passengers. In Chicago the surface lines carried 12,000,000 more passengers in 1925 than they carried in 1924. In New York City the surface lines carried 1,036,000,000 passengers last year, and the rapid transit lines carried 1,680,000,000. The street railways in Milwaukee, San Francisco, New Orleans and many smaller cities carried more passengers last year than they did in 1924.

I cite these facts lest any of you have the thought that the street railway is on the skids. It isn't. I know you'll be pleased to hear me say that the net income of our industry showed an increase of more than 13 per cent last year over 1924. Not only that, but the manufacturers report that they received more orders for cars and buses during the first three months of 1926 than they had in the corresponding months of several years past.

The street cars are going to continue to carry the masses. The buses operated by street railways are going to carry more and more passengers to and from parts of the communities not served by railway lines, necessarily at a higher fare than is charged for rail service, but with transfer privileges to and from the rail lines. These two services are rapidly being co-ordinated. The bus service is becoming more attractive to the owners of private automobiles, who have been finding it increasingly dangerous to operate in crowded streets and increasingly difficult to find places to park their cars.

As street car and bus service develops, provision for its growth must be made not only by the operating companies, but by the communities in which the companies operate, because mass transportation is absolutely essential to the prosperity, convenience and happiness of the people.

Being firmly convinced of these facts, I want to urge the adoption by all communities of the recommendations made by the committee on metropolitan facilities of the National Conference on Street and Highway Safety, especially the recommendation that each community form a voluntary civic committee to study the traffic problem, and looking to the future to provide a transportation plan that will take care of the increase in traffic as it comes about.

COMING MEETINGS OF *Electric Railway and Allied Associations*

May 19-20—Central Electric Traffic Association, Hotel Argonne, Lima, Ohio.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J. Car matters, June 9-11; locomotive matters, June 14-16.

June 21-25—American Society for Testing Materials, annual meeting, Haddon Hall, Atlantic City, N. J.

June 25-26—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 28-July 2—Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

July 8-10—Midwest Electric Railway Association, annual convention, Brown Palace Hotel, Denver, Colo.

August 12-13—Wisconsin Public Utility Association, Railway Section, La Crosse, Wis.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

I am urging our electric railway people to regard themselves as transportation experts rather than as strictly electric railway experts. The street railway people in every city and town should be so well acquainted with the transportation needs of their communities that they can say just what transportation the community should have. They should have no prejudice for the electric car if the bus would serve the community better; they should not recommend bus service if they know that an electric railway extension would render better service. Their duty is to give the community the best possible expert transportation advice. We have before us two distinct problems —the transit problem and the traffic problem—and certainly no men are better fitted by training and experience to handle the transit problem than the local electric railway men. Nor has any group of men more actual experience to present to any disinterested group, like the local chamber of commerce, that may be charged with study of the traffic problem.

The chamber of commerce should be the clearing house for all local problems. It should be the inspirational center of the community. Under its leadership the greatest good for the community should be accomplished. In this kind of activity, it seems to me, the directors and secretaries of commercial associations can find a wonderful opportunity for service to their communities. What is more important to any city than unimpeded transportation? Our streets are the arteries of commerce, the traffic flowing through them is the lifeblood of the city. Choke the arteries and circulation stops, and if it stops long enough business in the choked district is seriously damaged, if not killed.

A city that is known for its good street arrangement and its good traffic movement is bound to be a more prosperous city and more attractive to industry and commerce than one that has permitted itself to develop hardening of its traffic arteries. And unlimited parking produces just that—it thickens the walls of the arteries and narrows the space through which the lifeblood of business must flow, necessarily at higher pressure and with greater danger to civic life than would be the case were the arteries kept open for their purpose—the free movement of traffic.

I do not know of any panacea for traffic congestion. Conditions are different in different communities. But there is a remedy for conditions in every city. What that remedy may be is for the community to ascertain, preferably through its own committees and experts.

One of the commonest causes of traffic congestion is the parked vehicle, and this is most serious in its effect on street car movement. I do not think anyone will question my statement that the primary purpose of a business street is the movement of traffic. When communities permit automobilists to park their cars along both curbs of business streets, they narrow the street from 12 ft. to 14 ft., they blockade the doors of the merchants, they impede all traffic, they create a serious accident hazard, and they endanger or inconvenience the millions who go and come in the street cars. In addition to all that, they interfere with the movement of fire apparatus, and they turn the public streets into storage places for private property.

There simply isn't room in the streets for the parking of all the automobiles in the country—there must be restriction, or the streets will become impassable. I may be accused of special pleading when I make this statement, but let me remind you again that we street railway men must regard ourselves as the representatives of the masses of the people, and when I make a plea for easier movement of street railway cars through the city streets, I am pleading for the vast majority of the population of this country, for the forty millions that ride the street cars every day in the year.

Were there time, and were this the place, I could show you by statistics gathered from many cities that the street car carries from 80 to 85 per cent of all the human beings moving in the public streets in the rush hours, and that this great volume of street car traffic comprises only 15 to 20 per cent of the total number of vehicles in the streets. Put in another way, what I say is that private automobiles, comprising 80 to 85 per cent of the vehicles in the streets in rush hours, carry only 15 to 20 per cent of the traveling public.

These facts, well known to students of city planning and traffic control,

have brought the suggestion from that distinguished engineer and traffic expert the city manager of Cincinnati that the time is coming when there shall have to be a separation of the necessary from the unnecessary traffic in congested districts. The necessary traffic is the transportation of the people in public service vehicles—the street cars and the buses. These vehicles would be given preference, because they are providing mass transportation in the public service, and under public regulation and control. Following them in order of precedence would be the taxicabs and private automobiles.

I do not expect to see this separation of traffic for some time to come, although I believe it would be to the advantage of the public. Instead, I look for a more disinterested attitude toward the parking and congestion problems on the part of those who in the past have been inclined to suit their own whims and fancies rather than to have consideration for the welfare of the community as a whole. I believe that people whose personal convenience has meant the inconvenience of scores and hundreds of persons not so fortunate as to own a private automobile are going to recognize the inequity of the situation and agree to abolition of parking in streets where there are street railway tracks, and to the reduction of the volume of unnecessary traffic in such streets. There have been some excellent examples of this kind of public cooperation, notably in Pittsburgh, where the merchants and other business men have found by experience that abolition of parking has speeded up the movement of customers to their stores and has increased their business.

Competing Services Waste Space

There is no question in my mind but that there is a tremendous waste of street space by competing services in not a few communities. By all the rules of logic and by all the elements of justice, mass transportation service should be supplied the public by the rail lines. Competition by jitneys, whether they are competing with a city railway, or interstate highway vehicles competing with a steam railroad, cannot be justified, because it is wasteful, and damaging to the public interest.

Co-ordinated street railway and bus service is now being rendered by nearly 300 electric railway companies. The railways have found the bus to be an efficient supplementary vehicle, with which they can give service to parts of the community not yet sufficiently developed to warrant construction of rail lines, or to serve parts of the community with what we call de luxe service, that is, a seat for every passenger in vehicles with the most comfortable kind of seats, operating on an express schedule. The principle of co-ordinated service is sound, and is being carried to its logical conclusion in some of our cities, notably Philadelphia, where the rapid transit company is operating not only the rapid transit and street car lines, but the buses in city and suburban service, and the taxicabs as well. Such co-ordination makes for efficiency, economy and public satisfaction, and in addition to all that, makes possible adjustments of routes to aid in reducing congestion in the streets.

Trends in Motor Vehicle Legislation Discussed

CHANGES recently made in laws governing the operation of motor vehicles were outlined before the annual meeting of the National Highway Traffic Association at New York on April 30. According to Russell Huffman, secretary Motor Vehicle Conference Committee, license fees have gradually increased, particularly those for buses and trucks. There has been a marked tendency also to increase the gasoline taxes. The allowable widths of buses and trucks have been decreased, and there has been a tendency to reduce the gross weight allowed. With reference to speed, the trend has been to permit a much higher rate.

Common carrier vehicles are being more and more regulated by the state governments, he said. Equipment of motor vehicles, such as lights and brakes, have been receiving considerable attention at the hands of legislators. So far as enforcement goes, the tendency has been toward heavier penalties.

Mr. Huffman called attention to the growing desire on the part of state public utility bodies to increase their jurisdiction over the physical operation of vehicles. In this they are taking over functions formerly left to the motor vehicle departments of the state. At present, three-fourths of the states have enacted laws regulating widths and heights of motor vehicles. The greatest width permitted is 108 in. and the narrowest is 84 in. Most of the states have fixed the width limit at 96 in. and the height at 12 ft. 6 in. Weight limitations range from 30,000 to 18,000 lb., the average being about 24,000 lb. A noticeable movement during the past few years has been the tendency to base the weight limitations upon the character of the highway over which the vehicle is to operate. While this has not been enacted into law, several state highway officials are using this method to determine the weights permitted over their roads.

Other papers were presented by M. C. Horine, International Motor Company, New York, on "Highway Safety as Promoted by Adequate Brakes"; by E. P. Goodrich, consulting engineer, New York City, on "High-Speed Highways Required for Economic Transportation," and by Col. I. C. Moller, traffic engineer, Washington, D. C., on "Traffic Control Systems at Street Intersections."

Economizing in Purchases and Stores Department

Methods of Saving Money in Buying and Handling Materials and Supplies Discussed at Lively Meeting of New England Street Railway Club

PURCHASING department representatives, storekeepers and manufacturers' agents combined to make the May 6 meeting of the New England Street Railway Club at Boston, Mass., one of the liveliest in recent months, the topic of the day being how to save money in buying and handling materials and supplies. President F. D. Gordon occupied the chair, and after the usual topical meeting in the afternoon at the Copley Plaza Hotel an enjoyable dinner was held, with addresses by Managing Director Lucius S. Storrs of the American Electric Railway Association, George E. Pellissier, assistant general manager Holyoke Street Railway, and Harry C. White, Edison Lamp Works of the General Electric Company. Messrs. Storrs and Pellissier spoke on making better use of the opportunities afforded by the club and the American Electric Railway Association, while Mr. White gave a spectacular demonstration of high-voltage phenomena, with personal reminiscences of Thomas A. Edison and the late Dr. C. P. Steinmetz.

George E. Haggas, chief engineer Cumberland County Power & Light Company, Portland, Me., opened the afternoon meeting with an account of the success which has attended the combination of purchasing and engineering functions in one department in the past five years. The engineering department's knowledge of the future development of a public utility property qualifies it in large measure to undertake purchasing tasks. This advance information enables rush shipments to be reduced in number, and cuts down telephone and telegraph costs; it enables time to be saved in conferences between departments and in referring matters back and forth. Many interdepartmental letters and "memos" are thereby eliminated. This saves time and enables the company to buy at better advantage in many cases. Overhead costs and so-called "buck passing" are cut down. The company tries to buy in large volumes, pooling daily supplies with construction supplies.

R. S. Baldwin, purchasing agent the Connecticut Company, New Haven, Conn., discussed the value of quantity buying and its relation to market trends. Here the skill of the purchasing agent finds full expression, and upon his judgment much depends. Some kinds of supplies, like those for snow-fighting equipment, belong in the seasonal class and others, like pipe, fittings and steel parts, can advantageously be bought on the hand-to-mouth basis. Mr. Baldwin said that his company takes all cash discounts offered and saves about $36,000 per year by so doing. It is the company's practice not to disclose bids to competitors, and in general the "last" price is quoted at the outset. In the main it is better to buy standard material than to manufacture supplies in railway company shops, though this should not be an ironclad rule. Unless a very substantial saving results, company manufacturing is unjustifiable.

F. A. Barbey, Boston, in discussing the foregoing papers, commended the pioneer work of the Canadian Pacific Railway in establishing the authority of the purchasing agent as an executive buyer. He criticised the policy of tak-

ing cash discounts in view of the low price at which money can be borrowed, and pointed out the futility of trying to keep prices secret from the trade. George E. Pellissier, Holyoke, cited the excellent co-operation obtaining in his company between the engineers and purchasing staffs. James Alexander, Westinghouse company, New Haven, Conn., said that his company's cash discounts in general are given to buyers with lesser credit stability, although certain classes of merchandise and supplies carry cash discounts available generally. Mr. Baldwin does not figure the cash discount in comparing prices and bids, but regards it as a premium.

Advantages and Disadvantages of Quantity Buying

Storeroom practices was the subject of a paper by W. F. Crowe, secretary Springfield Street Railway. Mr. Crowe told how the methods used by his company and by the Worcester Consolidated Street Railway had been modified during the past six years and of the advantages which had resulted from the change. The present system was described in detail.

Under the procedure of this plan the storekeeper, being in need of material, places a requisition with the purchasing agent and after it has passed through the regular channels and received the necessary approvals, the purchasing agent arranges for the purchase of the material and issues his regular order, a copy of which is sent to the storekeeper. The latter notes on his copy of the requisition the order number and on his stock card indicates the date, requisition number and quantity ordered. When the material is received, the copy of the purchasing agent's order is used as the receiving record, on which is indicated the material received, etc., and passed along to the storekeeper as his record of material received for that day or under a particular order and is used by him in approving, checking and passing the invoice for the material received. After the storekeeper has certified on the invoice as to the quantity, quality and weights of the material received, this information is recorded on the stock card and the unit cost to be used in charging out that particular lot of material is determined, and the invoice forwarded to the manager for approval and return to the purchasing agent, who, after noting his records, forwards the original bill to the company's office for payment.

R. A. Weston, special accountant the Connecticut Company, told how the physical arrangement of material in the storeroom influences the buying of supplies. He suggested that the purchase order should originate at the bin in the storeroom.

"To do this we must have our material in such shape that we can count and inventory it at a glance and without handling," he continued. "This may mean revolutionizing your storeroom, but it can be done and it will be found to pay. Build open shelving. Pile your materials on the shelves in what is known as the 'unit piling' method. Make everything work toward visibility. You will find that you can concentrate your materials in much less space because of the greater flexibility of the system.

"Briefly, the 'unit piling' system consists in designating so many pieces of material, as they are being placed in stock, as a unit. This may be 5, 6, 10, 12, 50, 100, a gross, etc. Then as the material is stored it is separated in some manner so that each unit contains this designated number of pieces, and each such unit is in some way separated from the other units of the same material as to be plainly discernible, so that in taking stock the stockman simply counts the units and not the items."

T. H. McGarry, purchasing agent, explained how the Eastern Massachusetts Street Railway inaugurated a monthly budget system of ordering materials and supplies some five years ago. Prior to this time materials and supplies were requisitioned by two general storekeepers, one north of Boston, and one south of Boston, on a maximum-minimum stock basis. Materials and supplies so requisitioned and purchased were delivered to the three storerooms, and then distributed to various parts of the system from these storerooms. With the inauguration of the budget system this procedure was changed; now materials and supplies are in general delivered directly to each of the operating districts and shops.

On the twentieth of each month, the Boston purchasing department receives budget requisitions from the seventeen operating units. These requisitions are presented on printed forms and indicate the quantity of material required, the quantity on hand at the time requisition is issued, monthly consumption, also the use to which the material is to be put. The material covered by these budgets, unless of a special nature, is generally purchased and shipped the early part of the following month.

These monthly budget requisitions are originally prepared by the foremen of the several sub-departments, such as rolling stock, track, power, line, bus and truck and office supplies. The requisitions so prepared are carefully reviewed by the managers who are primarily responsible for the quantities ordered. In the case of the two shops, the superintendent of rolling stock and shops is responsible for all materials requisitioned, and the superintendent of the Quincy Point power station is responsible for that station's budget, and also for the Quincy automotive service station requirements.

In the opinion of the management the placing of responsibility for the requisitioning of materials and supplies with the department heads and managers has enabled the company to reduce its materials and supplies investment account materially.

Quantity buying in anticipation of future needs may mean prohibitive prices eventually because of obsolescence and other items making up carrying charges, according to W. W. Tirrell, statistician, and formerly examiner for the Interstate Commerce Commission. Some commodities deteriorate rapidly. Much material is carried from inventory to inventory, indicating unserviceable material in stock.

The purchasing department is not always responsible for quantity buying. Requisitions are drawn, frequently, too far in advance of actual requirements, and for excessive present quantities considering the prospective length of the work or job. Central control of stores operations curbs the desire of the under-official for large supplies to be kept constantly in stock. One control, held responsible for adequate supplies in stock, has worked well in the steam railroad field, wherever applied. A five-year comparison clearly demonstrates the benefits accruing under central control.

Stores budgets which place limits on the value of requisitions which can be issued each month have worked out well in the steam railroad industry, according to A. A. Ordway, purchasing agent Boston Elevated Railway. He thought, however, that they are too complicated and require too much bookkeeping to be satisfactory for electric railways.

Other contributions to the discussion of the subject of purchases and stores were made by A. B. Fuller, purchasing agent Union Street Railway, New Bedford, and W. F. Maher, storekeeper United Electric Railways, Providence. Abstracts of these papers will appear in a future issue.

Managing Director Storrs of the A.E.R.A. commended the increase of club members from the automotive industry in opening his address at the evening session. He emphasized the great value of round-table discussions to the industry and pictured the increased breadth of outlook derived from seeing how neighboring properties meet their problems. Group meetings and discussions as practiced by the Central and California association members are helpful and deserve wider application. The possibilities of building revenue on interurban railways from freight service were stressed. Regular meetings of operating men to discuss statistics of service rendered, costs, etc., offer helpful opportunities for betterment of practice on individual roads. A free interchange of ideas, the speaker said, is preferable to sluggish movement of thought resulting from excessive pride in their authorship. The industry would gain by reading more, Mr. Storrs declared. Closing, he outlined the activities of the A.E.R.A. headquarters staff and urged his hearers to call upon the New York office for help at all times.

Mr. Pellissier told how the New England Street Railway club could be made of more value to its members. His recommendations included the display of more interest by the railway executives, more definite objectives, and certain changes in method of electing officers.

Central Traffic Association Changes Meeting Place

CENTRAL Electric Traffic Association will hold its next regular meeting on May 19 and 20 at the Hotel Argonne, Lima, Ohio, instead of at Fort Wayne, Ind., as previously planned. This change of meeting place is due to the fact that hotel accommodations could not be secured at Fort Wayne on the dates mentioned.

Canadian Convention at Quebec June 2-4

BEAUTIFUL Château Frontenac, overlooking the St. Lawrence River in the city of Quebec, will throw its doors open to celebrate the 22d birthday of the Canadian Electric Railway Association. The meeting will be held jointly with the Canadian Electrical Association on June 2-4. Regular business sessions of the two associations will be held separately; but both will meet in the Dominion Drill Hall on Grande Allee, where also the manufacturers' exhibits will be shown.

The entertainment committee includes in its many diversions a golf tournament to be held at Kent links, a trip to Ste. Anne de Beaupré, a dinner and dance at Kent Hall, and a grand final ball at the Château.

William S. Hart, president of the Canadian Electric Railway Association, will preside at the meetings. The two papers to be presented are: "The Motor Bus in Urban Transportation," by Dean J. Locke, staff engineer Public Service Railway, Newark, N. J., and "Budgetary Control for Electric Railways," by H. C. Patten, comptroller Toronto Transportation Commission, Toronto, Canada.

In addition to these papers, special arrangements have this year been made for the discussion of six topics of general interest. Two of these topics will be discussed each day and two specially prepared five-minute talks will be the means used in presenting these subjects to the meeting.

The subjects are: June 2, "Transfer Tickets," J. McCulloch and C. M. Shaw; "Sweepers," F. D. Burpee and A. M. Lindsay. June 3, "Schedule Speeds," G. E. Waller and A. J. Tobin; "Armatures," A. M. Lindsay and D. Chenard. June 4, "Paving," A. T. Spencer and T. U. Fairlie; "Car Painting," F. S. Beattie and F. E. Holland.

American Association News

"Peddlers Do Their Stuff"

PEDDLERS held sway at the fifteenth regular meeting of the Metropolitan Section of the A.E.R.A., on the evening of May 7. The announcement of the meeting said that "free rein will be given to the peddler's spirits," and so it turned out. Horace Sisson presented "The Tough Life of a Peddler," movingly illustrated. The captions to the pictures portraying a day in the life of the peddler contained many wise cracks, but the film itself was somewhat weak in spots. The peddler is supposed to be a contrite mortal who waits in fear and trembling outside the office of the P. A., but in this case he hobnobbed familiarly with the railway officials until one began to wonder which of the two personages owned the Rolls Royce in which the two drove away together.

W. H. Woodin, president of the American Car & Foundry Company, was down on the program for the principal address, but he was prevented from attending. A letter of regret from him was read by Fred Harper. Mr. Woodin said in short that the manufacturer was a co-partner of the railway man. Each man's problem was the problem of the other.

Transportation must be made more desirable and more salable. He ran the gamut of all the trials and tribulations of the railway and drew a picture of the difference between the sales efforts of the manufacturer and the transportation company. Fresh and modern equipment is absolutely necessary. The silent transportation salesman is the car or the bus. One problem always remained, namely, that of selling the service whatever it may be. The manufacturer is the operator's silent partner —he can prosper only as the operator prospers.

President Hulme of the Metropolitan Section turned the meeting over to Jerry Stanton to conduct. Before doing so, however, Mr. Hulme said that the annual outing would be held at Pelham Bay Park on Aug. 11. Mr. Wheeler, chairman of the entertainment committee, had informed Mr. Hulme that only 400 could be accommodated at the dinner that day, so the need was imperative to get reservations in early.

The evening was concluded with a talk by Capt. Irving O'Hay, the original "Soldier of Fortune." He is one of the men on whom Richard Harding Davis based his book "The Soldier of Fortune." Captain O'Hay talked for one hour and forty minutes and there were not two dull minutes in his discourse. His remarks were packed with wit, wisdom and satire. The burden of his remarks was that it does not pay to take things too seriously.

Public Service Reorganizes Company Section

AFTER an interval of eight years, during which no meetings were held, the Public Service Railway Company section of the American Electric Railway Association has been reorganized. This section is the second oldest of the company sections and was very active until 1918, when the emergency conditions resulting from the World War necessitated a suspension of its activities. In answer to the call of M. R. Boylan, vice-president in charge of operation, nearly 400 old and new members met in the assembly room of the Public Service Terminal Building, Newark, N. J., on May 6 and reorganized the section.

Short talks stressing the value of the activities of company sections and expressing high hopes for the success of the new Public Service organization were made by C. E. Morgan, vice-president and general manager Brooklyn City Railroad; J. W. Hulme, assistant superintendent of equipment Interborough Rapid Transit Company; J. W. Welsh, executive secretary American Electric Railway Association; J. W. Colton, editor *Aera;* Labert St. Clair, publicity director American Electric Railway Association; Guy Hecker, special engineer American Electric Railway Association; H. C. Eddy, street railway engineer Board of Public Utility Commissioners of New Jersey; J. A. Miller, Jr., associate editor ELECTRIC RAILWAY JOURNAL, and Harlow Clark, director of publicity Public Service Railway.

Officers of the company section chosen for the coming year were: President, A. T. Warner, assistant to the vice-president in charge of operation; vice-president, Philip McGuire, manager Central Division, and secretary, Joseph O'Driscoll, bookkeeper, accounting department. Directors chosen were J. M. Symington, manager Essex division; J. E. Rutledge, manager Passaic Division: W. H. Shepard, manager Hudson Division; M. R. Boylan; vice-president, director ex officio.

It was decided to hold a series of meetings, possibly one in each of the operating divisions of the company. Refreshments were served at the conclusion of the meeting.

Special Reports Available

FOLLOWING is a list of special reports that have been prepared by the Bureau of Information and Service of the American Electric Railway Association. They are available to member companies upon request.

Bulletin No. 77: Electric Railway Operations in 1925.—Contains statement of the revenues, expenses, net revenue and passenger traffic of 327 railway companies and 96 affiliated bus undertakings in 1925, in comparison with the same items in 1924. Also gives complete comparative analysis of the operations of 221 railway companies classified into city, interurban and combination city and interurban companies with each group further classified into three smaller groups according to the size of the company. For each group there is shown a complete income statement, details of operating expenses, operating statistics and derived ratios and unit figures for comparison.

Bulletin No. 78: Bus Operations of Electric Railways in 1925.—A summary of the analysis of the bus operations of 92 electric railways and a tabulation of the individual returns of each company with certain of the more important figures shown on unit basis for purpose of a more accurate comparison. In addition, it contains combined statement of a large group of companies that reported detailed operating expenses and statistics showing a complete detail of expenses, passengers carried, bus-miles operated, gasoline consumed, and complete schedule of buses operated showing the seating capacity and a summary of the methods of depreciation on buses adopted by the various companies.

Bulletin No. 79: Special Factors Affecting Working Conditions of Electric Railway Trainmen.—A compilation of information covering a number of miscellaneous conditions such as status of workmen's compensation laws in the various states, employee representation systems, pension systems, requirements as to physical examinations, mutual benefit associations, establishment of recreation rooms, union membership and labor turnover during 1925.

Bulletin No. 80: Use of Reduced Rate Tickets.—An analysis of the effect of varying reductions from the cash fare on the proportion of reduced rate tickets used. For each company there is shown the cash fare and the ticket rates and then the percentage of revenue passengers paying cash fares, using the various ticket rates or traveling on a weekly pass where there is a weekly pass in effect.

In addition to the above, the following supplements have been prepared, bringing the information they cover, down to May 1:

Supplement No. 2 to Trainmen's Wage Bulletin No. 69.

Supplement No. 2 to Busmen's Wage Bulletin No. 70.

Supplement No. 8 to City and Interurban Fare Bulletins Nos. 40 and 41.

Cost of Living Studies (Bulletin No. 81).

The News of the Industry

New York Governor Hears Opposition to Bus Bills

Charges that sinister influences of an unknown origin are behind the Sargent and Thayer bills amending section 54 of the public service commission law so as to prevent a stagecoach corporation from acquiring more than 10 per cent of the capital stock of a street railroad corporation without the consent of the Public Service Commission were made by Assistant Corporation Counsel Gregory U. Harmon of Buffalo at a hearing held before Governor Smith on the two bills on May 13. "We don't want the International Railway to be owned by a bus line," declared Mr. Harmon. "Now they are operating both cars and buses, but as two separate companies, and their finances are separate and distinct." Representatives of organized labor from Buffalo also opposed the bills. Governor Smith stated that as he understands the matter the purpose of the bills is to get the same control over a bus company that tries to buy a street railroad as a transportation corporation acquiring the capital stock of another transportation corporation. "At the present time," said the Governor, "there is no regulation over a bus company buying stock of a street railroad company. This bill fixes it so that regulation is had the same as applies to other corporations."

It was also pointed out that at the present time a bus corporation organized as a business corporation and not under the transportation corporation law might acquire with no restriction the entire stock of a street railroad company. The Governor closed the hearing after the opposition had finished.

The Thayer bill and Sargent bill are different in that while the Sargent bill provides that bus corporations organized pursuant to the transportation corporation law shall be subject to its provisions, the Thayer bill provides that a corporation, however organized, shall be so subject to the public service or transit commission. The Fifth Avenue Coach Company is not organized under the transportation corporation law, but under the Thayer bill in the purchase of stock of a street railroad company would be subject to its provisions.

Elevated Men in Chicago Want More Pay

Five thousand employees of the Chicago Rapid Transit Company voted on May 8 to ask an increase in wages of 5 cents an hour when their present contracts with the company expire on May 31. They also request that a $1,000 death benefit and a weekly sick benefit of $20 be established at the expense of the company.

The new scale, if granted, would give motormen a maximum of 82 cents an hour, conductors 77 cents, guards 75 cents and proportionate raises in the wages of all shopmen, station employees, porters and trackmen. According to officials of the local union, the increase would re-establish the maximum rate prior to the 1922 reduction, thereby increasing the company's annual wage bill by $880,000.

Similar wage demands were made by train service employees of the Chicago Surface Lines at a meeting on May 3.

Service in Akron Restored to Normal

Railway There Believes Strike to Be Broken—Buses Play Big Part in Helping Company Free Itself from Union Domination—Interurbans Going Back Into Service

STREET CAR service has been restored to normal both day and night on the Akron city system of the Northern Ohio Power & Light Company. The Amalgamated Association has lost control and all trainmen now working have signed individual contracts. The Canton city situation is practically cleared up and the union control there broken. Complete day service has been restored in Canton and night service will be back to normal in a few days. No attempt has been made to operate interurban cars, but the company is determined to throw off union domination on its entire interurban system from Cleveland to Uhrichsville.

Buses and a satisfied public won the fight. At one time the company was operating 227 buses in city and interurban service. With these buses, aided by the few street cars that were manned by loyal trainmen, the riding public was fairly well accommodated. At any rate, they were so well satisfied that many openly expressed the hope that "the company would not compromise this time, but fight it out."

Along the entire interurban system, as well as in the cities, the company is receiving full public support. There probably has never been a strike of the magnitude of this upon any electric railway property where the public supported the company as it has in this instance in northern Ohio.

Hugh D. Friel, U. S. labor commissioner, who attempted to bring about a compromise, admitted in the newspapers that he had "never found such an apathetic public."

In Canton an attempt was made to secure the passage of an ordinance requiring the company to train men twenty days in the city before they could operate cars. The City Council laid the ordinance to rest in the judiciary committee.

In making the fight, the company's first step was an announcement that the "unwarranted strike had been called by a Mr. McMorrow of the Amalgamated Association without notice to the company or the public," but that "the company would operate all the cars possible and get additional buses without delay." The public was asked to have patience. The public said, in effect: "Fine, go to it, we have had enough street car strikes, so end them for all time."

The contest was staged in Akron City, the remainder of the system standing practically idle. The company announced in a public advertisement that it was "through with the Amalgamated Association" and that it "would not deal with union representatives." Day by day the Akron city service was built up. Starting with the Rose Avenue-Lakeside line, the Main Street and East Market lines were added. When full day service was restored on one line another was started. Thus was complete day service built. Following this, the work of bringing the night car service back to normal began. This was handled in the same manner as the day service. Ten days after the strike was called service was back to normal in Akron.

After Akron service had been restored, the company turned its attention to Canton, where enough loyal trainmen were voluntarily working to supply 50 per cent normal day service and more men were being trained. Starting with eleven runs that dropped off late in the afternoon, lines were added one by one and complete night service finally was established Thursday night of this week.

COMPANY PLANNING AHEAD

The work of restoring Massillon city service is now going on. The work of restoring interurban service will begin on May 17. This will be handled by divisions, the first to be taken up being the division south of Massillon, where there has been but little service.

The strike has been attended with very little violence so far. Bricks were thrown through the windows of several cars and buses. Shots were fired into a Barberton car, and one motorman and one bus driver were injured. Long tacks held upright by thin cardboard were strewn along bus routes, but patrols found them before much damage was done.

Approximately 100 interurban shopmen have been laid off since the strike started. They were in the Silver Lake Junction, Massillon and Dover shops.

Additional bus repair men have been employed.

For the last fifteen years, car riders in Akron and other parts of the Northern Ohio Power & Light Company's system have suffered from strikes. These strikes have lasted from one to eleven days, after which Amalgamated Association officials would bring about a settlement at the expense of the company. This time the company decided to fight it out with the union and establish the open shop policy under the individual contract system.

Last-minute messages state that the situation is satisfactory, with complete service in Akron and practically complete in Canton. No effort has been made to operate the interurbans and no effort will be made for perhaps another week. The buses are handling the interurban passengers satisfactorily. Efforts by the Amalgamated Association to bring about mediation and recognition of the union have all failed, with the public standing behind the company. Evidences of violence have been slight—an attempt was made to dynamite one of the company's high-tension lines and one motorman in Cuyahoga Falls was injured when a brick was thrown through a car window.

Bureau of Public Utilities Formed

The Research Bureau of Public Utilities was recently organized, with offices at 11 East 36th Street, New York, N. Y., by the National Association of Mutual Savings Banks to supply banks in all parts of the country with information on public utility bonds. This is the first of this kind of bureau, the formation of which resulted from action taken by the National Association of Mutual Savings Banks at its convention in Poland, Me., last June. A committee then was named to recommend action on the establishment of the bureau. The committee consulted with a group representing 30 public utilities and financial houses interested in public utilities.

New Subways in New York Face Delay

At an executive meeting of the committee of the whole of the Board of Estimate of New York on May 7 it was found that available funds would fall at least $50,000,000 short of the requirements for the fulfillment of the contracts already made or contemplated by the Board of Transportation for subway construction.

Members of the Board of Estimate pointed out that to raise all this money would not only preclude the carrying out of many urgent public improvements to which the Board of Estimate is committed, but would carry the city far beyond the constitutional limit of its borrowing capacity.

The suggestion was made as one ray of hope, in financing the subway plans, that part, at least, of the required funds would have to be raised by taxation, by putting it in the annual tax budget, which would probably mean a material increase in the tax rate.

John H. Delaney, chairman of the Board of Transportation, insisted the city must reserve $100,000,000 to carry out the subway construction program for the balance of the calendar year. He was informed by Comptroller Berry that all that it is possible to allocate for subway construction for the balance of the year is $50,000,000. Chairman Delaney insisted that the $100,000,000 would be absolutely necessary to meet the contracts to be awarded this year.

Franchise Nearly Ready

New Grant at Richmond to Go Before City Council for Final Action — Bus Measure Separate

Sitting for nearly two hours on May 3, and revising every section of the proposed blanket franchise, the streets committee of the City Council of Richmond, Va., completed its work, and the document, approved by every member, has been forwarded to the Common Council. That body fixed May 13 for disposition of the ordinance.

At the conclusion of the committee session Chairman Ordway Puller took occasion to thank his colleagues for the valiant and tireless service they had given to the work just completed. For more than three years this committee has considered this measure. It has gone into every phase of the situation and considered every angle and believes the grant is satisfactory to the people.

W. E. Wood, vice-president of the Virginia Electric & Power Company, also expressed his appreciation of the work of the committee since his association with its members. He said:

> We have the interests of Richmond at heart as much as the members of this committee or the most humble citizen, and we shall strive to carry out faithfully all the requirements of the franchise, and go even further when it looks like the city may gain in prosperity and progress through our efforts, feeble though they may be.

The plans of the company for the expenditure of $1,500,000 in the purchase of buses and other equipment and for extensions to the present railway system will be carried out as rapidly as possible, and the unification of the railway and bus lines accomplished with equal speed. Mr. Wood said:

> Now that the franchise has passed the committee and the road ahead seems clear, I wish to say for the company that we will not only live up to every stipulation contained in it, but that we will do so as rapidly as possible. The company is not looking for loopholes in the franchise, but for its speedy passage so that we can carry out the plans for the improvement of the local service that we have drawn up and which were presented to the committee.

The passage of the franchise through Common Council does not entirely clear the way for the unified bus and trolley system, as the city must adopt a bus ordinance, separate and distinct from the franchise, before the trolley and the bus lines can be unified.

When the matter was first broached the inclusion of the bus lines and the street car system into one franchise was considered and was agreeable to the power company. The city assumed the attitude, however, that to include the buses in the blanket franchise would be to place them under the control of the Virginia State Corporation Commission, as the railway system now is. By providing for them under a separate bus ordinance their control would still be in the hands of the city.

Express Car and Local Bus Service in Oakland and Berkeley

Application has been made by the Key System Transit Company to the City Councils of Oakland and Berkeley and to the California Railroad Commission for permission to operate express service on the Telegraph and Shattuck Avenue car lines with a parallel local bus service. In other words, the trolley cars will provide the speedy service to and from Oakland and Berkeley, while the buses will provide the slower means of transportation. If the application is granted and if the plan proves successful traffic in the East Bay cities will be revolutionized.

This is a reversal of the original plan, which called for express bus service between the two cities for a 15-cent fare. Under the new plan the fare will be the same as now charged all over the East Bay—7 cents.

J. P. Potter, general superintendent of the Key System Transit Company, is the father of the new plan. He and other officials of the company believe it will prove so successful that it will be extended to other lines and may be tried in other cities where rapid transit is becoming a problem.

It is proposed to reduce the running time of the street cars by a skip-stop schedule. Only eight stops will be made between Seventeenth Street, the heart of the business district in Oakland, and Alcatraz Avenue in Berkeley. It is estimated that the express trolley cars will cut down the running time from 28 to 21 minutes.

The express service will be supplied between the hours of 8 a.m. and 9 p.m. daily. Before and after those hours and on Sundays the schedule will be as at present.

Speaking of the proposal, General Manager George H. Harris said that the original suggestion of an express bus service was reversed after a study of conditions and in the interest of keeping present schedules.

Report Soon on Power for Rochester Subway

Power other than electricity may be used for hauling freight on the subway built by the city of Rochester, N. Y. This was indicated by the action of the Board of Contract and Supply when it rejected all bids for the overhead wiring. It is thought that either gasoline or oil burning engines will be used.

The subway is expected to be opened in the fall. It bisects the heart of Rochester and is built in the abandoned Erie Canal bed. Plans for its operation are still undecided. The project was put through at city expense, but municipal operation is believed to be a remote possibility. It is thought that some carrier, probably the New York State Railways, will operate the line under a lease.

Besides providing freight service for scores of industries, the new railroad will take the interurban cars off the streets of Rochester and provide limited passenger service from outlying sections into the business area.

A committee of citizens is expected to report.

Fare Hearing in New York State Adjourned

After completion of cross-examination of the witnesses of the New York State Railways by the city of Syracuse on May 13 an adjournment was taken by the Public Service Commission in the Syracuse rate case to a date to be announced later. Two days were consumed in cross-examination.

Franchise Discussion Renewed in Chicago

If the action of the committee on local transportation is ratified by the City Council of Chicago a clause providing for the construction of 30 miles of track extension by the Chicago Surface Lines every year for five years will be inserted in the Chicago traction ordinance recently drafted by Corporation Counsel Busch. Although the company has been unable to comply with the provision for several years, the present franchise calls for 23 miles of extensions each year.

Since they returned on May 6 from a ten-day tour of inspection in a number of eastern and Canadian cities the members of the transportation committee have been holding sessions daily with a view to an early settlement of the present difficulties.

Should the Council approve the essential features of the new ordinance as regards unified operation of all lines and immediate expansion of facilities, etc., legislative approval of the terminable permit plan will be asked of the State Legislature in 1927. Enactment of a law of this kind by the General Assembly would give Chicago home rule, with exclusive authority over all local transportation lines.

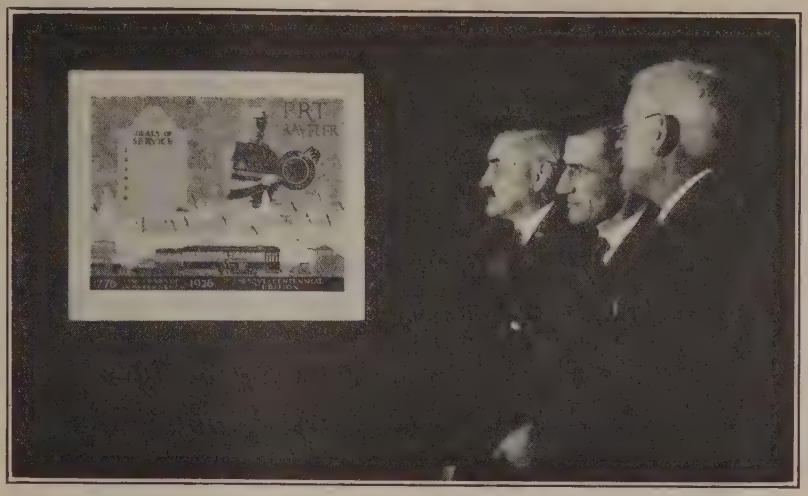
While the committee proceeds to discuss the surface lines ordinance submitted by Corporation Counsel Busch, the work of drafting a separate ordinance dealing with the elevated railway has also begun. The ordinance will provide for certain yearly extensions and for conjunctive operation with the surface lines and the proposed system of subways.

As a result of impressions gained in other cities Alderman Coughlin has submitted a plan, in connection with the ordinance now under consideration, which contemplates the construction of a comprehensive independent subway system based on the special assessment principle.

Electors Vote Approval of Hamilton, Ont., Contract

Hamilton electors voted on May 10 their approval of the franchise agreement between the city of Hamilton and the Hamilton Street Railway. The count stood 14,868 for and 4.768 against. By the terms of the agreement the city is assured of a 5-cent fare until 1928, when either party to the agreement may appeal to the governmental railway board for a change in the fare charge. The city may negotiate for the purchase of the system at the end of any five-year period, while the company undertakes to make many needed improvements to the system.

Abandonment of railway service in Hamilton was threatened in December, 1925, following the defeat of two railway by-laws, one providing for the city's purchasing the system and the other for the granting to the Hamilton Street Railway of a 25-year franchise. Last-minute negotiations resulted in a continuation of the service pending the submission of a new contract to the voters.



Judges and Winning Entry for the P. R. T. Cover Contest for 1926

Left to right, Ralph T. Senter, vice-president Mitten Management and member of the Art Club; Edward W. Redfield, artist, and Charles Harding, artist.

John J. Gough Wins P.R.T. Award

A Philadelphian, twenty years of age, without any special art training, won the Philadelphia Rapid Transit Company $500 prize for a cover suitable for reproduction in the Sesqui-Centennial number of the *P.R.T. Traveler*. He is John J. Gough, 2224 Christian Street. Mr. Gough is employed in the art department of the Ketterlinus Lithographic Manufacturing Company. He has been with the concern for two years, during which he developed his talent. The prize winner attributes his success to Thomas J. Flanagan of Germantown, an artist who has taken an interest in the young man and has taught him for two years while at the Ketterlinus company. In 1924, Mr. Gough won the second award in the art contest for a cover for the N.E.L.A. program, held by the Philadelphia Electric Company.

In the recent contest honorable mention went to two other Philadelphia artists, Harry S. Moskovitz, 1523 Chestnut Street, and Edward Gammon, 1762 Church Lane, Germantown. The contest was open to any artist in the United States. The rules specified that the design must possess some theme suggestive of the spirit of city transportation in the year of the Sesqui-Centennial International Exposition. As many as four colors could be used. Oils, water colors, charcoal, crayon, pen and ink or pencil designs were acceptable. Several hundred entries were received in this contest from Philadelphia and many out-of-town points.

Winning Cover in Contest for the Sesqui-Centennial Edition of the "P.R.T. Traveler"

Enabling Bill Signed by New York Governor

Governor Smith of New York has approved the Cuvillier bill as chapter 824 of the laws of 1926 empowering the city of New York for the improvement of traffic conditions in the streets "to acquire and remove from the streets any street surface or elevated railway, and to issue stock, bonds or tax notes to defray the cost thereof, and to authorize the sale of such street surface railway or elevated railroad by its owners to the city and to terminate, in such case, the franchise or franchises for the operation thereof."

During the legislative session the opponents of the measure dubbed it the "mystery" bill.

Denver's Picturesque Road Passes

Some years ago folks in the East, North, South and West were amused at receiving from Denver, Col., a post-card with the picture of a street car showing a horse riding on the rear platform. This was the Englewood-Cherrelyn line. The picture portrayed a true condition of affairs. It was like this. Dick, the horse, would pull the car up the hill from Englewood to Cherrelyn, and returning Dick would mount the rear platform while James O'Brien, the driver, would stand on the front platform so as to be ready to apply the brake. This plan was followed between 1883 and 1910.

Then the road was electrified. Now, in 1926, the cars have been abandoned because the line did not pay. Buses were placed in service on May 5.

First Run of Electrified System

A trial run was made recently on the newly electrified suburban service system of the Illinois Central Railway, between 75th Street, Chicago, and Kensington. The railway already has 130 motor-equipped coaches to be operated each with a trailer in two-car units, which may be coupled up into trains of ten-car length when needed. The work on the trolley wires from 39th Street north to Randolph is now being completed.

Freight Trains in Indiana Relieve Airplane Service

Two new freight trains are announced by the Union Traction Company of Indiana. One train leaves Wabash daily at 2:35 p.m., running via Marion and Anderson to Indianapolis, providing next morning deliveries from those points. The leaving time at Marion is 3:30 p.m. Morning freight service from Marion and Wabash will be continued. The additional train is designed to handle shipments made later in the day.

Business handled by airplane and Indianapolis - Detroit fast through freight trains is being supplemented with a special advance section which will leave Muncie daily at 5:30 p.m., running directly through to Fort Wayne, Ind., and Lima, Ohio. This will relieve the regular airplane train, which leaves Indianapolis under the new schedule at 5 p.m. and is expected to improve the growing overnight freight deliveries made between Indianapolis and points in Ohio and Michigan.

Officials of the Union Traction also announce a new schedule on the Anderson-Wabash line, designed to afford better connections at Anderson, Alexandria and Wabash.

Extensive Rerouting in Detroit

A rather extensive rerouting plan which has been under consideration for some time by the Department of Street Railways at Detroit, Mich., was put into effect on May 1, affecting Woodward, Jefferson, Brush, Hamilton and Oakland cars. It is the belief of the Street Railway Commission that the new plan will relieve congestion of traffic in the downtown section. Under the new schedules the number of cars passing through the block on Jefferson Avenue between Woodward Avenue and Griswold Street during the peak hours will be reduced from 286 to 70. On the southbound trips the Brush cars run south on Hastings Street to Farnsworth Avenue, west on Farnsworth Avenue to St. Antoine Street and south on St. Antoine Street. The changes in these latter routes were necessitated by the opening of the new plant of the American Car & Foundry Company on Russell Street, additional service being required to care for the employees of this plant. This is only one of the many changes, but it is typical in that it illustrates the ends sought to be achieved.

Stops Eliminated in Atlanta as Transit Aid

More than 500 eliminations and changes in stopping places on the railway system in Atlanta have just been put into effect under order of the State Public Service Commission following a petition of the Georgia Railway & Power Company. The changes involve the elimination of 345 of the present street car stops, the moving of 144 stops and the creation of 51 new stops on more than a score of routes operated by the company. They come as the result of a movement instigated more than two years ago when the city engaged the services of the Beeler Organization to survey and report upon transportation conditions in Atlanta. For the past six weeks the commission has been conducting hearings on the proposed stop changes, and in addition to studying the Beeler report has had its own consulting engineer go over most of the proposed changes.

In its preamble to the order making the changes effective the following benefits are enumerated by the commission to be derived by the changes:

1. Reduction in running time between 10 and 12 per cent.
2. Reduction in actual number of cars required for given frequency of service from 8 to 10 per cent.
3. Saving of 10 to 12 per cent of car-riding time.
4. Reduction in accidents of all kinds by actual records 33⅓ per cent.
5. Reduction of 8 to 10 per cent in power consumption.

The Public Service Commission states that it will give further consideration from time to time to any complaint made upon the part of the public after sufficient time has elapsed to determine the merits of each change.

Betterment Plans for St. Louis Traffic Awaited

E. R. Kinsey, president of the Board of Public Service of St. Louis, Mo., announced on May 6 that conclusions on the city's whole rapid transit problem would be reported in about three weeks. President Kinsey made this statement following a conference for harmonizing various plans for improvement of the city's traffic situation, both street car and vehicular, in its congested districts.

A special rapid transit committee of the Board of Aldermen has been considering the rapid transit question for more than a year. A subway for downtown St. Louis with elevated lines leading to outlying sections has been suggested.

Advertisements to Flourish in Oakland

The city of Oakland, Cal., has lost its fight to keep advertisements from the outside of street cars. Judge Warren V. Tryon, in the Alameda County Superior Court, has sustained an injunction against the ordinance recently passed by the City Council of Oakland prohibiting the advertisements. The judge ruled that the Council exceeded its police powers when it passed the ordinance on April 8. The Key System Transit Company and the Pacific Railway Advertisement Company the next day applied for the injunction.

The advertising company showed that it had spent $8,000 to prepare street cars for exterior advertising and that it held a contract with the Key System whereby the latter would be paid $40,000 a year for the use of the cars, and further that its contracts with other advertisers would be nullified if the ordinance were allowed to stand. The ordinance was declared confiscatory.

Judge Tryon in his ruling declared that the city of Oakland was empowered to pass ordinances against any plan of advertising that endangered the peace and safety of the citizens. He admitted that the advertisements in question were not pleasing to the eye, but the æsthetic was not a consideration in deciding what constituted the peace and welfare of the citizens.

Accident Prevention Bureau in Brooklyn Formed

An accident prevention bureau has been organized by the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., to assist the surface transportation department in the reduction of accidents. The work will be supervised by a committee consisting of W. S. Menden, president; George D. Yeomans, general counsel; William Siebert, superintendent of surface transportation. A. T. Brophy will act as secretary of the committee. Alfred H. Marsh has been appointed supervisor.

The full co-operation of every one is sought, in an effort to bring about the success of this movement. Each employee has been informed of the purpose and aims of the bureau. In a statement to the men it is said that only by the exercise of the greatest care in the operation of surface cars can the number of accidents be reduced.

Maine Road Threatens to Compete with Electrics

Objection has been raised to the plan of the Boston & Maine Railroad to supplant some of its local trains out of Portland, Me., with bus service. The railroad's idea was to run buses over highways in a roundabout way to its stations. This would put it in competition with the local railway lines of the Cumberland County Power & Light Company and call for the use of buses over roads which are hardly passable at some seasons of the year. Among the objectors are community loving individuals who seek to point out the danger of the unrestricted bus operated in a territory where satisfactory electric railway service is to be had. Typical of letters of protest against the proposed service was one from a resident of Scarboro. This man pointed out the injustice of the proposed service to the existing agency, fortifying the remarks he made with arguments from experience elsewhere. In conclusion he said:

> Let the Boston & Maine serve its territory and keep out of the C. C. P. & L. Co.'s territory. The people are satisfied with the way that company renders service. The road from Dunstan to Old Orchard through Pine Point is narrow and is in deplorable condition in spite of the fact that it costs the state and town about $1,000 per mile a year to maintain. The taxpayers cannot forever stand this and the extra wear and congestion buses will make. Heavy traffic belongs on steel rails, not on highways. Help us to stand by our electric road and leave room for safe travel on the highways. Let the Public Utilities Commission show whether or not it is for public service.

New York State Men Want 10 Cents an Hour More

Following a vote of the employees of the New York State Railways at Rochester to join with the workers of Utica and Syracuse in a demand for a wage increase of 10 cents an hour, and after conferences between union and railway officials, employees in the three cities were at an early date to ballot on new wage and working terms agreed on in these conferences to supplant the present contract, which expired on May 1. The conditions sought to be imposed are not to be revealed until they are submitted to the employees.

If the men reject the proposal offered in behalf of the railway by President James F. Hamilton, the joint board of the union must appeal to Mr. Hamilton for another conference to draft terms.

The Rochester men had discussed a separate contract, believing that in view of the increased fare in their city, they were entitled to higher pay than the men in Syracuse and Utica, where applications for fare increases are pending before the State Public Service Commission.

The balloting in the three cities will be carried on the same day, but independently. The totals will be pooled. Last year Rochester's adverse vote on the terms submitted by the company was overridden by the combined favorable totals of the two other cities.

The present scale in the three upstate cities is 55 cents for two-man car operators, 57 cents for interurban employees and 60 cents for platform men on one-man cars.

The men voted on May 11 to reject the company's proposal.

News Notes

Fares Remain Ten Cents.—The Illinois Commerce Commission and the Illinois Power Company have reached an agreement under the terms of which the existing fare rates in Springfield are renewed. The basic rate of 6¼ cents for token buyers is maintained, but the sale of family books is eliminated. Cash fares remain 10 cents, with two tokens for 15 cents and eight for 50 cents. Children's fare remains 3 cents.

One-Man Cars Only in LaCrosse.—With the extension of one-man car service by the Mississippi Valley Public Service Company to its north side and Sixteenth Street lines on May 2 the entire city of LaCrosse is now provided with cars of the one-man type.

Will Consider New Line.—The Wisconsin Gas & Electric Company is considering the petition signed by residents of the northeast section of Racine, Wis., and presented to the City Council urging the construction of a car line north from High Street. This line would serve this newly developed section of the city and would eliminate the inconvenience now experienced by residents of this section.

"The Orange Line" Chosen.—In a contest conducted among employees of the Wisconsin Power & Light Company through the medium of its house organ, *Power & Light News*, to secure a suitable name or slogan for use on its cars and buses, "The Orange Line" was accepted as the most popular name. Fred Whitely, local manager of the company, and M. C. Alexander, Madison, divided first honors, each having submitted the same name. The new name will be painted on all cars and buses.

Fares Increased.—A 3-cent increase in fares between Carthage and Joplin, Mo., on the Southwest Missouri Railroad, Webb City, Mo., was recently ordered by the Public Service Commission. The increase, in effect, is added between Webb City and Joplin. The fare between those cities now will be 13 cents instead of 10 cents and from Carthage to Joplin the fare will be 38 cents instead of 35 cents. The 3-cent increase was asked in a petition filed last January after the 8-cent city fare went into effect in Joplin. The claim was based on the ground that the same 8-cent fare rate should apply to the Joplin city zone for traffic from points beyond that zone as well as for traffic within the zone.

Tunnel Proposed for Pedestrians.—A plan to construct a tunnel at the corner of Howard and Lexington Streets, Baltimore, Md., for the use of pedestrians has been submitted to the city officials by Mark M. Hardy, president of the Pedestrian Subway Company of America. The corner involved is the most congested in the business section and is passed by several lines of the United Railways & Electric Company. The proposal made to the city is that the subway be built with entrances and exits at all four corners. The subway also would provide space for stores. Mayor Howard W. Jackson, who heard the plan outlined by Mr. Hardy, requested that the details be put in writing so he could place the subject before the members of the Board of Estimate.

Skip-Stop Plan Extended.—The Winnipeg Electric Company put into effect on May 5 the skip-stop system on the Academy Road line (Broadway) in Winnipeg, Man. The new system will provide that street cars stop at every other street outbound, while on the inbound journey they will stop at every street missed on the outward journey. The system is not new in Winnipeg, but has been used for some years on the busiest car lines. The stops are indicated by white poles.

Hearings on Rerouting Scheduled.—The Maryland Public Service Commission has set June 1 as the date to open the hearings on the rerouting of the cars of the United Railways & Electric Company, Baltimore. The application for an order requiring the United to make the changes is sought by the Baltimore Traffic Survey Commission. The proposed changes are contained in a report of the traffic commission made recently. It has been stated by the United that it will agree to the rerouting only if the motorists and others involved in the survey agree to the proposed changes recommended for vehicular traffic.

Postponement of Increased Tariff Ordered.—An order suspending until May 20 the proposed new tariff of the Utah Light & Traction Company, Salt Lake City, providing for an increase in fares, has been issued by the Public Utilities Commission of Utah. If the commission passes upon the application of the company for increased rates before that date, the order will be rescinded and a new one issued in accordance with the determination of the commission. In the meantime, however, fares will remain unchanged.

Three Centennial Transit Bills Up.—Three ordinances affecting transportation service at the Sesqui-Centennial Exposition grounds, Philadelphia, Pa., call for trolley and bus terminals of the Philadelphia Rapid Transit Company and for extension of trackage from present limits of the lines into the grounds. The Mayor is authorized by the ordinances to enter into agreements with the Philadelphia Rapid Rapid Transit Company and the Philadelphia Rural Transit Company, a subsidiary, for the maintenance of the tracks and terminals, which will remain in force until July 1, 1957, the life of the city-company partnership agreement. The work is under way. In addition to the terminals, a second ordinance will arrange for track extensions into the grounds. The third ordinance provides for the removal of tracks in Broad Street between Bigler Street and Terminal Avenue, which will be restored after the celebration closes.

Price of Trip Books Reduced.—The Washington, Baltimore & Annapolis Electric Railroad has been granted authority by the Maryland Public Service Commission to put in effect on June 1 a reduced rate. The five-trip books between Baltimore and the District of Columbia line will be reduced from $11.40 to $10 and the ten-trip books from $22.80 to $19.50.

Recent Bus Developments

Interesting Tour for Sesqui-Centennial Sightseer

To meet the needs of the Sesqui-Centennial sightseer, interested in historical and industrial Philadelphia, Pa., the Philadelphia Rapid Transit Company started three bus tours on May 3. Two of the tours cover greater Philadelphia. The third makes daily trips to Valley Forge. Officials of the company have been working for several months on these tours, and after much research have planned routes which cover the most important historical points in the city.

Tour No. 1, which leaves the P.R.T. waiting room, 237 S. Broad Street, four times daily, includes a trip through historic, business and residential Philadelphia. The cost is $1. The tour consumes 1¾ hours. Tour No. 2 includes greater Philadelphia and Germantown. It consumes 3¾ hours. The cost is $2.50. Two trips are made daily for the Valley Forge tour.

The Mitten Management gas-electric bus, parlor car type, is used on all tours. Trained sightseeing men will accompany these trips. In connection with the tours, the company has issued an interesting folder giving a glimpse of historic Philadelphia and environs.

Buses on Trial in Manitowoc

The proposed plan of the Wisconsin Public Service Corporation to discontinue temporarily its railway service in Manitowoc in favor of city-wide bus service for a trial period of four months was practically accepted by the Common Council when it ordered the street committee of the Council to draw up and submit an ordinance providing for the plan. If the buses do not live up to the claim of the company that they will provide better service the city, in its agreement with the company, is allowed the right to order the return of the street cars. The company also plans to establish a new cross-town bus line on the south side now unserved. A fare of 10 cents will be charged or six tickets for 50 cents. The railway system has been a losing proposition. It is claimed that a fare of 13 cents instead of the present 6 cents would have to be charged if the company were to receive a fair return on its investment. A month's extension from the original proposal for a three months trial was arranged to permit the company to purchase new bus equipment.

Bus Substitution on Outer End of Bergen Line

The Board of Public Utility Commissioners of New Jersey has authorized the Public Service Railway, Newark, N. J., to suspend railway service on the Bergen trolley route between Hackensack and Fairview. The track on which service is to be suspended is the outer end of a long route beginning at the Fourteenth Street terminal in Hoboken. Although known under one name, this was in reality two lines, as there has never been any physical connection across the tracks of the Erie Railroad at Little Ferry. Operation on the outer section has been hampered by congestion in the narrow streets of Hackensack and it is thought that bus operation in this area will be more satisfactory.

The application was made simultaneously with one for approval of local permits to operate twelve buses between and including Hackensack and the Weehawken Ferry, Weehawken, a distance of 11 miles, and on a route which paralleled the railway tracks. This petition was also acted upon favorably by the board, which ruled that both the abandonment of railway service and the installation of the bus served public convenience and necessity. Railway service between Fairview and Hoboken will be continued.

Sightseeing Service in Ottawa

The Ottawa Electric Railway, Ottawa, Ont., plans to operate a sightseeing service with modern bus equipment. The first coach is now nearing completion in the plant of the Ottawa Car Manufacturing Company. This will be the first venture of its kind in Ottawa.

The route which the coach will cover two and three times a day will take in 19 miles of the most beautiful parts of Ottawa and the manufacturing districts of Ottawa and Hull. The new coach is the latest word in that type of vehicle. It will be mounted on a special motor coach body and painted outside in the regular O. E. R. colors. The first coach is to be named "Miss Ottawa."

Major F. D. Burpee, vice-president and manager of the company, states that this department will be expanded just as soon as there is sufficient traffic to warrant it. In addition to the coach for sightseeing purposes, the company is rushing to completion several other buses for its Eastview and Hunt Club services.

Steam Rail May Not Compete with Electric Railway

Massachusetts Department of Public Utilities So Rules—Dissenting Opinion Scores the New Haven Railroad on the Basis of Former Record

IMPORTANT expressions on the issue of railroads engaging in the bus business to the extent of paralleling instead of feeding their rail lines and the wisdom of opening the way for a new competition with the established service of the Boston Elevated Railway are formulated by the Massachusetts Department of Public Utilities.

The case involves the petition of the New York, New Haven & Hartford Railroad, through its subsidiary, for authority to operate a bus line between Boston and Providence.

By a majority vote the department has issued an order permitting the railroad to own and operate the bus line, without the right to do any local business in the territory that is served by the Boston Elevated.

Chairman Henry C. Attwill of the Department of Public Utilities dissents from the decision of his associates in this case. In doing so he stated his views on the law and economics in the situation. He said that he had grave doubts about the propriety of the railroad engaging in the transportation business through such a subsidiary, but that he did not base his dissent upon that at this time. While the certificate issued is a temporary certificate, Mr. Attwill assumed that it was the intention of his associates to make the grant permanent. Unusual zeal was exhibited by the representatives of the railroad, certain residents of North Attleboro, Plainville and Wrentham and the Retail Trade Board of the Boston Chamber of Commerce in their advocacy of the application. On this account Mr. Attwill felt it desirable to state the reasons which led him to dissent from the action of his associates.

It was his view that the Legislature, by providing that it should be unlawful to operate motor vehicles for the carriage of passengers in the manner of a street railway unless a certificate of public convenience and necessity was granted by the Department of Utilities, intended to eliminate unnecessary competition with the existing means of transportation and hoped thus to coordinate the various means of transportation, to the end that unwise duplication, with its consequent waste, might be avoided, so far as was practicable. He said:

> When we grant a certificate merely because there are those who prefer to ride in buses rather than on rails, or because there are those who object to changing from a motor vehicle to a vehicle operated on rails, in the course of their journey, or, forsooth, because a railroad desires to drive out a competitor, we are not, in my judgment, performing our duty as the law contemplates.
>
> I believe that the transportation of passengers in the streets in the areas served by the Boston Elevated Railway system should be done, so far as is practicable, by the Boston Elevated Railway. If we are to permit buses to be operated in the area of the railway system upon the argument that they are not in competition with the Elevated system because the passengers are carried to and from points not in the Elevated area, by the same reasoning we ought to grant any application that may be made by the Eastern Massachusetts Street Railway, the Middlesex & Boston Street Railway or any other transportation company which operates in the vicinity of Boston and which may desire to transport passengers into Boston. If we do not guard zealously the interests of the Boston Elevated Railway system, when is the deficit from operation now assessed against the communities to be repaid, or how are we to have improvements in the system? I appreciate the argument that this line will not take a passenger that now uses the Boston Elevated Railway system or the Eastern Massachusetts Street Railway, but how long will the people of Dedham, Norwood and Westwood be content to see the people of

Walpole and beyond enjoying transportation to and from Boston by means of their highways while such transportation is denied to them?

It was his judgment the granting of this certificate would inevitably be followed by a demand that motor vehicles passing through Westwood, Dedham and Norwood furnish the people of those communities facilities to and from Boston, or that the Eastern Massachusetts Street Railway furnish like facilities. He said that if this demand be met, it means the taking away from the Elevated system passengers who ride on the Eastern Massachusetts Street Railway and transfer to the Elevated system. On this point he said:

If others, who have an equally meritorius case, are authorized to operate their motor vehicles into the center of Boston, it means a very serious diminishing of passengers carried on the Boston Elevated Railway system. In addition to the serious menace to the Elevated system, in my opinion the granting of this petition means the beginning of a conflict between the railroads and the street railways for passenger traffic on the highways. Nor do I believe it in the interest of the public or the railroad that the application should be granted.

He was unable to visualize how a railroad can carry passengers by motor vehicles any cheaper than others.

At the hearing it was contended by the petitioners that to operate trains so as properly to care for the passengers going by motor vehicles to Dedham would increase the cost of train operation between Dedham and Boston by $75,000 a year. Mr. Attwill assumed by this that it is contemplated by the railroad to operate buses between Dedham and Boston more frequently than trains are now operated. He doubted the wisdom of adding to the already congested condition of the Boston highways when adequate means were at hand to avoid it.

Finally, he was not convinced that under the statutes authorizing railroads to operate motor vehicles the commission was warranted in granting this application. Chapter 135 of the acts of 1925 provides for the insertion in chapter 180 of the General Laws of a section, to be numbered 70A, under the heading "Auxiliary Services." It is by this section that the railroad obtains its authority to operate motor vehicles. He said:

I do not believe it was the intention of the Legislature that railroads should engage in what is to all intents and purposes a street railway business. The proposed bus line is not to be operated as an auxiliary to the train service. It is not proposed to operate the motor vehicles to connect with existing train service along the route. In fact, the contrary appears to be the purpose. It is proposed to operate the line in the manner of a street railway in competition with its own rails. The results of the street railway operations by this railroad in the past have not been such as to inspire confidence in its proposed activity in street transportation. In my judgment, the main purpose of this operation is to drive out by competition the interstate bus lines now operating between Providence and Boston. This, in my opinion, is not a sufficient warrant for the granting of a certificate. I think that the railroad can better improve its financial condition by devoting its energies to the improvement of its rail service than by operating agencies which are bound to impair that service.

I do not wish to be understood as saying that a railroad should not operate motor vehicles on the highways in substitution of trains where the patronage is such as not to warrant the operation of the train. When this is done, however, I believe that through rates and service in connection with the system of the railroad should apply substantially as if the service were entirely by rail.

Dissenting Commissioner Scores New Haven Railroad

THE proposed bus line is not to be operated as an auxiliary to the train service. It is not proposed to operate the motor vehicles to connect with existing train service along the route. In fact, the contrary appears to be the purpose. It is proposed to operate the line in the manner of a street railway in competition with its own rails. The results of the street railway operations by this railroad in the past have not been such as to inspire confidence in its proposed activity in street transportation. In my judgment, the main purpose of this operation is to drive out by competition the interstate bus lines now operating between Providence and Boston. This, in my opinion, is not a sufficient warrant for the granting of a certificate.—*Mr. Attwill.*

Interurban Emphasizes Its Bus Service

Appreciation is fast growing of the extent of the bus operation of the Union Traction Company of Indiana. At the present time the company is operating bus lines out of Indianapolis to Peru by the way of Kokomo and a separate line from Indianapolis to Noblesville, and another line is operated from Indianapolis to Muncie via Anderson, and a line from Anderson to Marion. An Anderson city line is operated from the downtown area to the Remy factory No. 1. Buses and bus lines are Union Traction property and are intended to furnish a co-ordinate passenger service. In this connection the company has recently explained that it is worth while for all employees to recognize this phase of transportation as Union Traction property and to aid and cooperate in bus service as well as car service. Bus service for special parties is available at all times.

Bill to Regulate Interstate Buses Passed by Senate

The Senate has passed the bill to regulate interstate commerce by bus operated for hire through the interstate tunnel now being constructed under the Hudson River between New York City and Jersey City and over the interstate bridge now being constructed across the Delaware River between Philadelphia and Camden, N. J. Senator Reed, the sponsor of the bill, said that the bridge would be opened on July 1 and that if some measure of the kind were not passed the value of these highways to the public might be destroyed by the congestion of traffic that would result. He argued that no other state was interested and that all the parties were agreed on the bill. The measure simply vested in the Public Service Commission and the Bridge and Tunnel Commission the right to control the number of buses to be permitted to use the tunnel and the bridge. The highway facilities afforded by the tunnel and the bridge have been provided entirely by money raised by the states. According to Mr. Reed the measure advocated by him simply proposed that Congress delegate to a local commission the power to regulate, subject to Interstate Commerce Commission review, the flow of interstate commerce across these two rivers. Reservations made in the bill distinctly provided that any order made by the I. C. C. should supersede all rulings by the local authorities.

Establishes More Lines in Fond du Lac.—The Wisconsin Power & Light Company started the operation of two more cross-town bus lines on May 10, to supply twenty-minute service with transfer privileges to residents in the southeast and northeast parts of Fond du Lac. This territory is not served by the railway. Not so long ago a cross-town bus line was established between the eastern and western parts of Fond du Lac.

Ten Cents Cash Authorized.—An increase in fare on all bus lines operated by the Santa Barbara & Suburban Railway, Santa Barbara, Cal., was authorized recently by the City Council. The cash fare is now 10 cents against the old fare of 8 cents. No change was made in the 7-cent, five for 35 cents token rate, or the weekly pass for $1. The application was made to the City Council, which alone has the power of granting such permits wholly within the municipality.

Pays for Bus Deficit.—The County Commissioners of Multnomah County, Oregon, have paid $450 to the Portland Electric Power Company to cover the deficit in operation to that company in running buses to Marquam Hill during the first quarter of 1926. Service by bus was stipulated in the government's decision to locate the $1,250,000 veterans' hospital on that site in Portland.

Will Supplement Rail Service.—Application for permission to operate a bus line from Logan, Utah, to Preston, Idaho, has been filed with the Public Utilities Commission of Utah by the Utah-Idaho Central Railroad. The application sets forth the fact that the public may be more adequately served if buses supplement railway service.

Service with Double-Deck Buses in Boston. — Double-deck buses invaded Boston, Mass., on May 8. Leaving the entrance to the Fenway at Charlesgate East at 8 a.m, the first trip was made down Boylston Street to Charles and thence to Bowdoin Square and return. The round trip consumes 40 minutes. Newspaper men, photographers, officials of the Elevated, and Joseph Phillips, representing the makers of the new bus, made the official first trip. The new bus is an experiment. The degree of its success will regulate any action taken to increase this service.

New Route Planned.—The Gardner & Templeton Street Railway, Gardner, Mass., has been granted a license to operate buses from Gardner to the Athol Fair Grounds, which is the terminal of the Athol & Orange Street Railway. The running time between the two points is 1½ hours. This new route was planned with a view to stimulating patronage on the Athol & Orange Street Railway. The bus route will bring people east of Athol to that center for pleasure and to trade.

Financial and Corporate

Governing Body at Chicago to Act as Protective Committee

The governing committee of the Chicago City & Connecting Railways Collateral Trust has announced that it had unanimously recommended the action taken by the owners and holders of the sinking fund 5 per cent gold bonds and participating certificates of that company through protective committees.

Pursuant to this recommendation the governing committee, consisting of Bernard E. Sunny, chairman; Roger A. Baldwin, secretary; Henry H. Porter, Rufus C. Dawes, Samuel M. Felton and Charles Day, which owns or represents owners of substantial amounts of these collateral trust bonds, has consented to act as a protective committee with respect to the bonds for the purposes set forth in a deposit agreement dated Feb. 1, 1926.

The action was taken to enable the committee to deal with the important questions presented by the maturity on Jan. 1, 1927, of $20,616,000 of the 5 per cent bonds; by the maturity on Feb. 1, 1927, of nearly $40,000,000 par value outstanding underlying first mortgage bonds of the Chicago City Railway and the Calumet & South Chicago Railway, and by the expiration by limitation on Jan. 21, 1927, of the street railway franchises that are now in force.

The deposit agreement among other things provides that in event of there being formulated a plan for a comprehensive unified system of transportation for the city of Chicago or any similar plan which is acceptable to the committee, copies of the plan will be filed with the depositaries and notice given to the depositors, who shall have the right to file dissents from such plan or to withdraw from the agreement, which they will be at liberty to do upon the terms that are stated in the agreement.

Revenues on Salt Lake City Property Increase

Operating revenues of the Salt Lake & Utah Railroad, Salt Lake City, Utah, which went into the hands of a receiver on July 25, 1925, were $734,035 for the year 1925, an increase of $27,392 over the previous years. The operating expenses, according to a report filed with the Public Utilities Commission of Utah, were $579,931, an increase of $73,840. The ratio of operating expenses to operating revenues was 79.01 per cent. The taxes paid were $62,330, of which $20.65 was to the federal government.

The total amount that was invested in road and equipment on Dec. 31, 1925, was $7,978,866, an increase of $37,471 over the previous year. The debit balance transferred to profit and loss was $60,426, a decrease of $108,452 over the previous year. The length of road owned is 75.14 miles and the average investment per mile is $104,146, while the length of track owned is 97.40 miles, with an average investment of $80,344 per mile of track. The total par value of capital stock outstanding on Dec. 31, 1925, was $5,043,700.

W. C. Orem, president of the Salt Lake & Utah Railroad, in commenting on its present condition and prospects for increased business, stated that during the months of March and April of the present year the passenger business of the road had increased considerably over the corresponding period for each of the past five years, and that it has far surpassed the business of the similar two months last year. He further stated that the road is getting back to a healthy condition, with freight business on the increase.

Proxies Asked for New York & Harlem Meeting

A committee composed of Ernest Sturm, William D. Scholle and Edwin Thorn, representing stockholders, has sent out letters to stockholders of the New York & Harlem Railroad, New York, N. Y., asking for proxies for the annual meeting on May 18. The letter says that sale of the railway line was approved at the stockholders' meeting on April 23, the New York Central's votes assuring that result. Disposition of the avails of such sale was not determined at that meeting. The committee was represented at the meeting and expressed the view that this money should be paid to the Harlem stockholders. The letter adds:

> The use to which these avails shall be put, the real estate situation, the relationship under the lease and other allied matters make it desirable that the minority "Harlem" stockholders should remain firmly banded together, as we always have been since the formation of your committee, to the end that the interests of the minority stockholders should be protected.

Kansas City Affairs Reviewed

Gross Income in 1925 Before Interest Charges Was $1,262,634—Reorganization Committee Brings Out Many Interesting Facts—Reference Made to Bus Operations

AFFAIRS of the Kansas City Railways, Kansas City, Mo., in the past twelve months in connection with the reorganization are revived in a circular issued by the reorganization committee, M. A. Traylor, chairman. In 1925 gross income before interest charges was $1,262,634, while in 1924 it was $1,256,430. The statement of earnings for the years 1925 and 1924 follows:

STATEMENT OF EARNINGS OF THE KANSAS CITY RAILWAYS

	1925	1924
Total railway operating revenue	$9,777,958	$10,024,230
Total motor coach operating revenue	189,621	.....
Miscellaneous rents, etc.—non-operating	26,902	17,937
Interest on securities owned	223,394	181,450
Total revenue from all sources	$10,217,875	$10,223,617
Total operating expenses and taxes	8,955,241	8,967,187
Gross income before interest charges	$ 1,262,634	$1,256,430

The operating expenses shown above include annual charges of $1,200,000 on account of personal injury and property damage claims and $120,000 on account of receivers' and legal expenses. These two items, aggregating $1,320,000 a year, represent an appropriation of $110,000 each month from Nov. 1, 1921, to date and charged to operating expenses. Adjusting these and other similar items to the actual expenditures, the gross income for 1925 was $1,975,244 and for 1924 $1,911,926. If from these latter figures are deducted the revenue received from interest on securities owned, which do not represent normal earnings from the property, the final adjusted gross income for 1925 was $1,751,850 and for 1924 $1,730,476.

In the first three months of 1926 the total revenue from all sources as compared with the first quarter of 1925 showed an increase of $58,941 and gross income before interest charges a decrease of $130,907. This decrease is due in large part to unprofitable bus operation during the winter months, with traffic light and expenses of bus operation at maximum.

The rates of fare over the street car lines have continued at 8 cents cash, two tokens for 15 cents, five tickets for 35 cents, averaging approximately 7½ cents per revenue passenger. The fare on the express bus line is 25 cents and on other bus lines 10 cents with certain transfer privileges.

The federal court having jurisdiction in the railways receivership proceedings rendered a decision, on Dec. 30, 1924, upholding the validity of the first mortgage and of the first mortgage securities against the attacks of the second mortgage bondholders, other contesting creditors and preferred stockholders, and directing a foreclosure of the first mortgage.

Under date of May 15, 1925, a final decree was entered foreclosing the first mortgage and directing a sale of the property and franchises of the company in satisfaction of the debt.

The preferred stockholders' committee and a large creditor of the company

EARNINGS ON NEW SECURITIES OF THE KANSAS CITY RAILWAYS

Adjusted gross income as above for the year 1925	$1,751,850
Interest requirements under the plan of reorganization—6 per cent on $12,465,200 new first mortgage bonds	747,912
Amount applicable to new preferred stock	$1,003,938
Annual dividends on 83,364 shares of preferred at $7 a share	583,548
Balance after preferred dividends	$420,390

have appealed from this final decree to the Circuit Court of Appeals for the Eighth Circuit, where appeals are still pending.

Promptly after entry of the final decree the reorganization committee promulgated and adopted a plan for the reorganization of the railway, which was unanimously approved by the first mortgage bondholders' and collateral noteholders' protective committees. The plan was thereupon issued under date of June 1, 1925, and copies sent to all depositors with the protective committees and to all known holders of non-deposited first mortgage securities. This plan was accepted and approved by depositors with the protective committees without a single exception and a large number of non-depositors also joined and deposited their securities. In consequence, there is now on deposit with the reorganization committee approximately 96.6 per cent of the outstanding first mortgage securities, aggregating approximately $24,200,000 principal amount out of approximately $25,000,000 principal amount of such securities outstanding.

The plan has been submitted to the Public Service Commission of Missouri as required by law, and under date of Dec. 12, 1925, the commission authorized the issuance of the new securities provided therein upon the new company being vested with the property. This plan was thereupon declared operative by the committee on Dec. 18, 1925.

The reorganization committee has received during the past several months a partial payment on account of the first mortgage securities under order of the federal court in the amount of approximately $1,500,000 and has applied a large part of this fund to the purchase of the judgments for personal injury and property damages and to settlement of the claim of the Kansas City Terminal Railway in accordance with the terms and provisions of the plan.

In accordance with the terms of the final decree and by order of the federal court the properties and franchises of the railway in Missouri and Kansas were offered for sale at auction by the court's commissioner on Jan. 4, 1926, and were bid in by a representative of the reorganization committee for the sum of $8,000,000, the sale being subject to confirmation by the court.

The second mortgage bondholders' committee and preferred stockholders' committee filed objections to the sale and opposed confirmation. Hearings on these objections have been held before the court within the past few days and the case taken under advisement. The reorganization committee understands that, in case the sale be confirmed, the contestants will probably appeal to the upper court. In consequence of these pending legal proceedings and other matters involved in the reorganization, the committee is unable to predict when the receivership will terminate, when the properties will be turned over to the new company and when the new securities will be issued. The committee will, however, endeavor to effect the reorganization with all reasonable promptness.

The receivers of the railway have installed a comprehensive system of motor coach lines to supplement the railway system. These lines consist of through trunk lines, feeder lines and express service to the outlying sections of the city. About 65 buses are now in operation. These lines are operated under a three-year franchise granted by the city. Service over all franchise routes was installed in November, 1925. The reorganization committee advocated the installation of these bus lines as a means of affording additional transportation facilities with a unified system.

Revenue on Connecticut Company's Lines Higher

In the fifty-fourth annual report of the New York, New Haven & Hartford Railroad to the stockholders E. J. Pearson, president, states that the favorable result of the year for the New Haven, and for the railroads of the country as a whole, has been largely due, although generally not so recognized, to more than normal traffic, reduced cost of fuel and some supplies and the absence of any unusual difficulties affecting transportation or industry.

During the year rail service was discontinued on 38.5 miles of road of the Connecticut Company, including 15.9 miles of electrified steam road between Tafts and Central Village, and bus service substituted. These lines, excepting the electrified steam road, were faced with the necessity for extensive track rehabilitation due to pavement construction, and, by reason of their low earning capacity, these expenditures were not warranted. There were also added 64.55 miles of bus routes serving new territory. The combined bus and rail operation shows a slight increase in revenue over the previous year.

On the New York, Westchester & Boston Railway 10,154,199 passengers were carried during the year, an increase of 1,056,489. Of this increase about 200,000 were handled through the Harlem River Terminal, taking advantage of the improved facilities mentioned in the 1924 report. The extension of the road from Larchmont to Mamaroneck was opened for business on March 21, 1926.

The accompanying table shows the income account of the electric railway properties of the New York, New Haven & Hartford Railroad during 1925 compared with the previous year.

Receiver's Rights in Rockford Questioned

The battle over the disposition of the properties of the Rockford City Traction Company, Rockford, Ill., and affiliated interurban lines began recently in the Circuit Court with prospect of developing into a lengthy legal clash over settlement. Adam Gschwindt, receiver, was denied the right to petition the court to sell real estate of the road or to abandon the Freeport, Beloit & Janesville lines. The final order was not entered by Judge E. D. Shurtleff, who will return later to hear further arguments in the case. The court held that the receiver's petitions could not be considered because, as a non-partisan officer of the law, it is not within his province to become a party to litigation of property in his custody.

The receiver had petitioned the court that first mortgage bondholders of the Rockford & Interurban line, second mortgage bondholders of the Beloit and Janesville lines and second mortgage bondholders of the Freeport lines should have the physical property of the lines returned to them. Mr. Gschwindt suggested that these bondholders either guarantee the deficit on each line or have their own respective receivers appointed. The second petition sought authority to sell real estate owned by the traction system but not required in operation of the lines. It is believed that petitions representing both these

	Connecticut Company		Berkshire Street Railway		New York, Westchester & Boston Railway		New York & Stamford Railway		Westchester Street Railroad ¶	
	Year 1925	Comparison with 1924 Increase or *Decrease*	Year 1925	Comparison with 1924 Increase or *Decrease*	Year 1925	Comparison with 1924 Increase or *Decrease*	Year 1925	Comparison with 1924 Increase or *Decrease*	Year 1925	Comparison with 1924 Increase or *Decrease*
Total operating revenues	$14,522,176	$147,338	$858,875	*$69,703*	$1,648,900	$127,454	$517,949	$4,142	$221,911	$5,262
Total operating expenses	11,585,187	*5,548*	749,647	*24,422*	1,060,438	67,242	385,258	*8,393*	192,277	*17,478*
Net operating revenue	$2,936,989	$152,886	$109,228	*$45,280*	$588,462	$60,212	132,691	$13,035	$29,633	$22,740
Tax accruals	630,327	41,871	20,144	*18,994*	216,287	6,271	23,346	*1,349*	11,301	*1,358*
Operating income	$2,306,661	$111,015	$89,083	*$26,286*	$372,174	$53,941	$109,344	$14,385	$18,332	$24,099
Non-operating income	50,758	324	6,161	4,384	6,971	*3,655*	855	*2,950*	630	*545*
Gross income	$2,357,420	$111,340	$95.245	*$21,902*	$379,146	$50,285	$110,200	$11,434	$18,962	$23,553
Deductions from gross income	1,491,946	*51,665*	*302,710	7,728	‡2,051,947	88,157	§*113,567	1,512	‖31,704	*1,732*
Net income	$865,474	$163,005	†*$207,465*	*$29,630*	†*$1,672,800*	*$37,871*	†*$3,367*	$9,922	†*$12,741*	$25,286

* Deductions from gross income include $209,980 interest accruing to the New York, New Haven & Hartford Railroad but not included in the income account of that company.

† *Deficit.*

‡ Deductions from gross income include $1,100,008 interest accruing to the New York, New Haven & Hartford Railroad but not included in the income account of that company.

§ Deductions from gross income include $40,225 interest accruing to the New York, New Haven & Hartford Railroad but not included in the income account of that company.

¶ This company is entirely separate from the New York, Westchester and Boston Railway. Road in hands of receiver from Feb. 29, 1920—receiver's account included.

‖ Deductions from gross income include $26,858 interest accruing to the New York, New Haven & Hartford Railroad but not included in the income account of that company.

actions will be renewed in the name of the committee of bondholders. Eleven pieces of property owned by the Rockford City Traction Company and estimated to be worth $300,000 have been offered for sale.

Trading Starts in New St. Louis Securities

Trading in the securities of the St. Louis Public Service Company, the proposed successor to the United Railways, was started on the St. Louis Stock Exchange on May 3. Initial sales of the common were at $17.50 to $17.75.

On May 1 the interests which will control the new company made an initial payment of about $1,450,000 on the 343,645 shares of new common.

Holders of the 163,830 shares of United Railways preferred had the privilege of buying three shares of the new common at $12.50 for each two shares of preferred held. Holders of the $9,790,000 Transit Company bonds had the right to buy ten new shares at $12.50 for each $1,000 bond held.

Such common stock in the new company not purchased by the United Railway preferred stockholders and Transit bond owners under their option privileges will be offered to the holders of the 249,139 shares of United Railways common stock, 72 per cent of which is owned by North American Company.

The payments made on May 1 were on the basis of $4.50 a share. Another payment of $4 will be due on July 1 and a third payment of $4 at some date not yet set. The total revenue from the sale of the new common stock will be $4,295,562.

The refinancing of the railway properties is based on the expectation that the company will be granted a service-at-cost franchise from the city that will permit it to earn 7 per cent return on a valuation of $57,000,000.

The initial trading in the new stock was slightly above the price that prevailed on the United Railways preferred stock, which carried the privilege of purchase of the new stock. The preferred had been selling for $7. Holders had the privilege of buying the new stock on the basis of $12.50 a share. On this basis the new stock had a tentative stock market value of $17.17.

6 per Cent Preferred Issue for Illinois Power & Light

A special meeting of stockholders of the Illinois Power & Light Corporation, Chicago, Ill., has been called for July 14 for the purpose of approving a change in the dividend rate upon the unissued 70,000 shares of the preferred stock of the corporation from 7 per cent to 6 per cent per annum.

The new issue will have the same rights, privileges, preferences and restrictions as the present 7 per cent issue. The only difference between the two issues will be in the dividend rate.

The officers and directors believe that in the interests of the present holders of preferred stock of the corporation and of the corporation itself, advantage should be taken of the improved conditions which make it possible to dispose of a 6 per cent preferred stock on a satisfactory basis.

Earnings in Akron Higher in 1925

Earnings from transportation on the lines of the Northern Ohio Power & Light Company, Akron, Ohio, for the year ended Dec. 31, 1925, increased to $6,177,542; for the year previous these earnings were $5,364,189. A study of the sources of gross earnings during the past several years shows that the earnings in this department, with a few years excepted, have increased gradually. An increase of 2,468,025 revenue passengers was shown for the year 1925; 160,823 tons of freight were handled and the gross revenue for this kind of business increased from $498,970 in 1924 to $647,712 in 1925. These facts were contained in the report to the stockholders for the year ended Dec. 31, 1925.

The company continued its policy of expending large sums of money on additions and betterments with $1,645,919 for use in the transportation department. The most important expenditures included the purchase of 33 single-deck buses of improved type for operation in city and interurban service, the purchase from competitors and other bus operating companies of 38 buses of various types, construction in the interurban division of 18,100 ft. of single track, double tracking interurban line between Canton and Massillon, rebuilding and equipping 103 electric passenger cars for one-man operation and the purchase of six new freight trail cars, together with the rebuilding of four passenger cars into freight motor cars.

There were many new developments in the transportation department. A franchise covering operations in the city of Akron was approved in November, 1924.

The report refers to the expansion of the customer-ownership idea and to the consistent growth of this partnership between the people of northern Ohio and the Northern Ohio Power & Light. During 1925 the company began the group life insurance plan, providing for its employees, in service a year or more, a life insurance free of cost. The pension fund at the end of the year totaled $52,929 in cash and investments, an increase of $2,297 over 1924. The company continued its systematic safety and accident prevention program in all of its departments with gratifying results. Notwithstanding a considerable increase in car and bus miles operated in 1925 over 1924, and notwithstanding an increase in registration of automobiles of approximately 30 per cent, the records show that not a single passenger or trainman was killed on the entire system during the past three years.

On Feb. 9, 1926, a resolution was passed by the directors to amend the articles of incorporation so as to change the company's corporate name to Northern Ohio Power & Light Company. This amendment was submitted to the stockholders and approved by them at a special meeting held on March 15, 1926. The report says the directors deemed it advisable to make this change in name in view of the fact that the electric light and power business had become such an increasingly important factor in the affairs of the company.

The accompanying statements show the income and expenses for 1925 as well as the traffic carried for 1925 and four previous years on the city system and interurban systems.

COMPARATIVE STATEMENT OF EARNINGS OF THE NORTHERN OHIO POWER & LIGHT COMPANY

Gross Earnings:	1925	1924
Electric	$5,322,156	$4,716,808
Transportation	6,177,541	5,364,189
Total	$11,499,698	$10,080,997
Operating expenses and taxes:		
Operating expenses	$7,618,402	$7,161,533
Taxes	822,000	741,900
Total	$8,440,402	$7,903,433
Gross income	$3,059,296	$2,177,563
Interest and other fixed charges	1,557,841	1,441,966
Net income available for dividends and retirement reserve	$1,501,454	$735,596
Dividends on preferred stock	437,334	431,750
Balance	$1,064,119	$303,846
Ratio of operating expenses to gross earnings, per cent	66.25	71.04
Ratio of operating expenses and taxes to gross earnings, per cent	73.40	78.40

STATEMENT OF PASSENGERS CARRIED BY NORTHERN OHIO POWER & LIGHT COMPANY

Calendar Year	Revenue Passengers Carried—Rail and Buses: City Systems	Interurban Systems
1921	47,799,437	16,820,442
1922	50,632,248	17,117,064
1923	54,112,423	16,784,535
1924	48,563,053	14,478,984
1925	51,352,849	14,266,754

Small Increase in Passengers in Baltimore

A comparison of street car passengers carried by the United Railways & Electric Company, Baltimore, Md., for the first quarter of this year, as against the corresponding period of 1925, is noted below:

	1926	1925	Per Cent Increase or Decrease
January	18,952,322	18,764,851	+ .99
February	17,458,793	17,620,805	— .92
March	19,760,440	19,213,695	+2.85
	56,171,555	55,599,351	+1.03

$1,700,000 of Equipment Trusts Offered

Mercantile Securities Company, San Francisco, Cal., is offering for subscription $1,700,000 of 5½ per cent equipment trust gold certificates of the Key System Transit Company, Oakland, Cal., issued under the Philadelphia plan. The certificates are dated April 1, 1926, and mature serially, the final maturity being April 1, 1938. Prices vary from 100.48 for the earliest maturity, namely, April 1, 1927, to 97.01 for the last maturity, and the yields vary from 5 per cent to 5.85 per cent. The certificates are issued in part payment for 29 double-truck motor passenger cars and two double-end steel turbo-electric ferryboats.

All of the equipment will be new and will cost not less than $2,153,561, of which an initial payment of $453,416, representing more than 20 per cent of

the cost of the equipment, will be paid by the railway. Under the terms of the lease the company will pay a rental sufficient to cover dividend warrants, annual maturities and all other charges as they fall due. The Key System Transit Company provides transportation service for Oakland, Berkeley, Alameda and other cities on the eastern shore of San Francisco Bay.

Illinois Interurban Ordered Sold

Assets of the Alton, Granite & St. Louis Traction Company and the Alton Gas & Electric Company have been ordered sold by Judge Lindley of Danville, Ill., sitting in the United States District Court at East St. Louis, Ill., following a hearing on a bill to foreclose a mortgage on the properties. The mortgage was security for a bond issue of $2,496,000 floated in 1904.

Both companies have been in receivership, the traction system since 1920 and the gas and electric properties since last December. Thomas W. Gregory, vice-president of the East St. Louis & Suburban Railway, is receiver for both companies. The traction company operates an interurban line from Alton, Ill., to St. Louis, Mo. At the hearing before Judge Lindley, Mr. Gregory stated that no interest had been paid on the traction company's bond issue of $2,496,000 since the receivership proceedings were instituted. He expressed the belief that the plants and lines of the companies could be grouped and sold as units. The indebtedness of the two companies is about $4,000,000.

Peter P. Schafer, Champaign, Ill., has been appointed special master to conduct the sale.

Dayton Company Moves Offices.—The Cincinnati, Hamilton & Dayton Railway, which has purchased the railway property of the Cincinnati & Dayton Traction Company, has announced the removal of its general offices to 928 Third National Building, Dayton, Ohio. J. H. McClure is vice-president and general manager of the new property.

Wants Less Equipment in Service.—The Cairo & St. Louis Railroad filed an application with the City Council of Cairo, Ill., recently seeking permission to discontinue operation of four of its street cars in Cairo. Three of the cars, which it is proposed to discontinue, operate on regular schedule in the business district, while the other is an "owl" car. The company contends that its revenues continue to decline.

Would Substitute Buses.—The Central Illinois Traction Company has filed a petition with the City Council of Paris, Ill., seeking to discontinue railway service there. At one time the lines were a paying proposition, but the automobile has ruined the business, according to the statement. The company asks the right to operate buses over the streets now occupied by its tracks.

$975,438 Allowed in Condemnation Case.—Supreme Court Justice O'Malley at New York has awarded $975,438 to the Interborough Rapid Transit Company and Manhattan Railways in consideration of $4,200,000 in claims for condemnation by the city of the 42d Street elevated spur. The company claimed $3,600,000 for easements of light, air and access surrendered, but received $750,000; its franchise was held at $100,000 and the award was $25,000; its physical value was placed at $185,513 and $120,438 was awarded. The spur that was removed extended west from Third Avenue for a distance of several blocks to the junction of Fourth Avenue with 42d Street at the Grand Central Station.

Railway Effects for Sale. — H. E. Salzberg Company, Inc., which recently purchased all the physical assets of the former New York & Long Island Traction Company, New York, N. Y., has announced that it will offer for sale all the recently acquired equipment. The effects for sale include Birney cars, Brill cars, Southern cars, sweepers, snow plows, work cars, materials and supplies, machine shop equipment, track tools and approximately 40 miles of track and overhead material. The Salzberg Company deals in new and second-hand electrical and steam machinery at 50 Church Street, New York City.

$8,312 Added to Stabilizing Fund.—The Des Moines City Railway, Des Moines, Iowa, added $8,312 to its stabilizing fund in March, according to the monthly report, bringing the fund to $8,381. Total revenue for the month was $213,253 and passengers numbered 2,188,838. The fund has to reach $150,000 before a fare decrease will be possible.

Condensed Data on Barstow Utility Properties.—"Public Utility Properties of General Gas & Electric Corporation" has been issued by W. S. Barstow & Company, Inc., financial and operating managers. This is a book of 146 pages containing information regarding public utility companies with yearly gross earnings of approximately $21,500,000 after intercompany eliminations. A thorough description of each property is given, together with its latest income account and an explanation of its capitalization.

Revenue Exceeds Expenses.—For the month of March, 1926, the revenue of the Boston Elevated Railway, Boston, Mass., exceeded the cost of service by $161,773, against $211,956 in March, 1925. The number of revenue passengers totaled 33,802,662, against 32,338,441. Total miles operated, including bus-miles, amounted to 5,045,642, against 4,798,747 in March, 1925.

$7,000,000 Valuation Item Fought.—Arguments have been completed in the Circuit Court of Baltimore on a petition which seeks to restrain the Maryland Public Service Commission and the United Railways & Electric Company from including a valuation of $7,000,000 on easements of the company in the valuation placed on the property. In a recent hearing covering several months the commission included the $7,000,000 item in the total valuation of $77,000,000. The petition was filed by Clarence W. Miles, formerly people's counsel, before the Public Service Commission. Since the conclusion of the case before the commission he has resigned. Linwood L. Clark, representing the People's Corporation, also appeared in the court case and argued against an item of $8,560,210 allowed for going value. Thomas J. Tingley, newly appointed people's counsel, also appeared in the case. Edwin G. Baetjer, Joseph G. France and Attorney-General Thomas H. Robinson appeared for the defendants.

Georgia Light Rumor Corrected.—Published accounts that Cities Service Company had secured a substantial interest in the stock of the Georgia Light, Railway & Power Company are stated to be erroneous. It is understood, however, that H. L. Doherty & Company has secured a stock interest in the company which is not a controlling interest.

Nebraska Read Would Discontinue 8 Miles.—The Omaha & Lincoln Railway & Light Company, Lincoln, Neb., has asked permission of the State Railway Commission to abandon that part of its interurban lines between Ralston and Papillion, a distance of 3.9 miles, and to substitute bus service. It also desires to withdraw railway service on its 4-mile line between 26th and N Streets, Omaha, and Ralston, with the exception of two cars a day to be operated solely for the purpose of holding the franchise. Partial service on this stretch has been given by buses, and the full schedule will be so maintained hereafter if approval is received. The Ralston-Papillion line traverses a highway that is about to be surfaced. Traffic over the railway is alleged to be insufficient to pay expenses of operating this section.

Messrs. Gannon and Smith on St. Louis Board.—Frank A. Gannon and J. Sheppard Smith were elected directors of the United Railways, St. Louis, at the annual meeting, succeeding Murray Charleton, resigned, and John I. Beggs, deceased. Other directors were re-elected.

May Abandon One Line.—The Jamestown Street Railway is planning the abandonment of the Willard Street line from Winsor Street to the city line in Jamestown, N. Y. According to the company officials, the line, which was opened in 1914, has never produced sufficient revenue to warrant the maintenance of service. Another factor entering into the situation is the large expenditure the company is making for the repair of pavements between the rails on various streets.

Gross Corporate Income Increases.—The San Francisco, Napa & Calistoga Railway, operating in Vallejo, Napa, St. Helena and Calistoga, reports to the California Railroad Commission its 1925 operating revenue at $246,913, compared with $275,280 for 1924. The operating expenses, excluding taxes, for 1925 were $157,322, and $186,069 for 1924, leaving net operating revenue of $89,591 for 1925 and $89,210 for 1924. During 1925 taxes charged to operation were $16,928 and for 1924 $22,838. Deducting the taxes leaves operating income of $72,662 for 1925, and $66,372 for 1924. Adding the non-operating income of the company to the operating income, results in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $76,383 for 1925 and $70,508 for 1924.

Personal Items

Thomas Pumfrey Chief Engineer of Oregon Property

Thomas Pumfrey has been appointed chief engineer of the Portland Electric Power Company, Portland, Ore., in entire charge of maintenance of way and equipment for the city lines, buses and interurban lines. The office of master mechanic, which has been vacant since the recent death of Frank B. Willis, will be abolished.

Mr. Pumfrey has had charge of the maintenance and way departments for sixteen years with supervision over construction and maintenance of tracks, roadways, bridges, buildings and over all engineering and draughting work. In addition to those duties he will now have entire charge of all rolling stock.

Before he went with the Portland Electric Power Company, Mr. Pumfrey served as chief engineer of the International Railway, Buffalo, N. Y., from 1899 to 1910.

Illinois Traction Appointments Announced

Five promotions in the personnel of the Illinois Traction System are announced by L. B. Martin, general superintendent, Springfield, Ill.

J. H. Morris, who has been superintendent of the southern division at Staunton for several years, is promoted to be superintendent of transportation, with headquarters at Springfield, vice A. S. Bergschneider, resigned.

O. C. Genung is advanced to fill Mr. Morris' place as superintendent of the southern division with headquarters at Staunton, Ill.

S. W. Haberle, who has been chief dispatcher at Mackinaw Junction, Ill., is appointed superintendent of the northern division, with headquarters at Mackinaw Junction, to succeed Mr. Genung.

C. F. Warren is to be chief dispatcher at Mackinaw Junction in place of Mr. Haberle.

B. C. Leach is appointed chief dispatcher at Staunton, Ill.

Mr. Morris, the new superintendent of transportation, started with the company many years ago, handling the dispatcher's key at Mackinaw Junction.

F. S. Dewey, vice-president of the Kansas City Power & Light Company, Kansas City, Mo., was elected to serve as president of the Missouri Association of Public Utilities at the annual convention at Springfield, Mo. The convention adjourned on May 6.

Thomas P. Easten was, on April 14, appointed general manager of the Newcastle-on-Tyne Corporation Tramways. Mr. Easten has been with the undertaking since its commencement, and for some time has been assistant general manager. He succeeds Ernest Hatton, the general manager and engineer, who has retired owing to ill health. W. T. Dalton, assistant engineer since the opening of the electric tramways, was appointed engineer at a salary of £800 per annum.

Leslie Spraggon Assistant to President at Buffalo

Leslie Spraggon, superintendent of equipment of the International Railway, Buffalo, N. Y., has been promoted to assistant to the president of the company. Announcement of the appointment was made by B. J. Yungbluth, president of the International, following the resignation of H. L. Mack as vice-president in charge of engineering.

Mr. Spraggon has been with the International system since Dec. 1, 1924. He has been in charge of maintenance of all cars and buses. His early life was spent in Pittsburgh, where he attended the public schools. Mr. Spraggon's first position was as an apprentice in the electrical department of the Carnegie Steel Company of Pittsburgh. He took a night course in electrical engineering in the Westinghouse technical night school and in 1914 went to the Terre Haute, Indianapolis & Eastern Traction Company as assistant master mechanic. There he remained until 1916. Later he was with the Connecticut Company, New Haven, Conn., as assistant supervisor of equipment.

Leslie Spraggon

He was called back to take charge of that company's equipment after a service of two years with the Boston office of the Westinghouse Electric & Manufacturing Company as sales engineer. From the Connecticut Company Mr. Spraggon went with the International Railway.

During his service as superintendent of equipment of the International Mr. Spraggon was very largely responsible for a 40 per cent reduction in removal of cars from service because of mechanical defects. This improved maintenance, President Yungbluth says, helped the transportation department to achieve a record last year of 90 per cent cars on time at terminal points. He was in charge of the company's safety first work.

Obituary

Benjamin B. Odell, Jr.

Benjamin Barker Odell, Jr., former Governor of New York, and identified with transit developments in Newburgh, N. Y., for many years, died in that city on May 9. Besides his prominent political affiliations, he was at one time president of the Consolidated Gas, Electric Light, Heat & Power Company of Newburgh and of the Central Hudson Steamboat Company.

Mr. Odell at the time of his death was president of the Newburgh Public Service Corporation, formerly the Newburgh City & Suburban Railway. This property has long been owned and controlled by the Odell family.

He and his associates in the management of that company, B. Bryant Odell and H. B. Odell, formerly one of its officers, were among the first to recognize the place of the bus in transportation and to use that vehicle in increasing the effectiveness of the local transportation service to the people of Newburgh and vicinity.

Clarence Thayer Fernaid

Clarence Thayer Fernald, chief engineer of the Boston Elevated Railway, Boston, Mass., died on May 11 in Melrose. It is to be said of Mr. Fernald that he was an integral part of the rapid transit system of Boston. He grew up with it, assisted in its construction and since the death of his predecessor, Chief Engineer George A. Kimball, he has directed the completion of the Elevated system up to its present point. He was intimately connected with the building of every branch of it, the elevated structures and the tunnels and subways, and lately the construction of the extension along the Shawmut branch of the New York, New Haven & Hartford Railroad.

Mr. Fernald became associated with the Boston Elevated Railway in 1900. Prior to that time he had been employed by the Norfolk & Western Railway on preliminary and location surveys and in a general engineering practice in Melrose. Mr. Fernald was born in Charleston, Mass., in 1866. He received a common and high school education and some years later took up scientific studies and advanced mathematics at Massachusetts Institute.

Mr. Fernald had interests beyond his profession. He took part in the affairs of his community, was active in its political interests as a Republican and had connection with several fraternal, social and technical associations.

Frank B. Willis, master mechanic of the Portland Electric Power Company, Portland, Ore., died at his home in that city on April 27. Mr. Willis was a member of the Twenty-Year Club of the company. Working at first as machinist, he was made foreman of the shops in 1912, when all the shops were consolidated. In 1922 he was promoted to assistant mechanic, and just one year ago in April he became master mechanic upon the death of Franklin P. Maize. Mr. Willis was 44 years of age.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Richmond Will Have Expenditure of $1,000,000

Passage of the new blanket franchise in Richmond, Va., by the City Council will mark the entrance of the Virginia Electric & Power Company on an extensive program of bus and trolley coordination. Approximately $1,000,000 will be spent immediately in the purchase of new buses and street cars and in making extensions and improvements to service. It is expected that this measure will be passed by the Council members without much opposition and that the work of improving the transportation system may be well under way within the next few weeks.

Disposition of the required bus ordinance is expected to be made while the blanket franchise is being subjected to the legal period of advertisement, a step not necessary with the bus paper. The company expended $400,000 in the purchase of the assets of the Richmond Rapid Transit Corporation last September and since that time has added a number of new buses to the system. As soon as the bus ordinance has been adopted approximately 25 new buses will be added to the fleet, at a cost of between $160,000 and $175,000. These new units will be used on extensions of lines planned by the company.

Delivery is being made of the fifteen street cars ordered by the company from the American Car Company, St. Louis, Mo., in December. Specifications on these units appeared in ELECTRIC RAILWAY JOURNAL on March 20, 1926.

Oil-Electric for Chicago

The first oil-electric locomotive for use in the West recently left for Chicago under its own power, for delivery to the Chicago & Northwestern Railway. The locomotive was built by the General Electric, Ingersoll-Rand and American Locomotive companies. It has a capacity of 300 hp. and a weight of 60 tons; running unattached, its operating cost is said to average 1.2 cents per mile. The unit was to run directly from Schenectady to Chicago on its delivery trip.

Executive Changes in Fort Pitt Steel Casting Company

John W. Guay, formerly sales engineer of the Fort Pitt Steel Casting Company, McKeesport, Pa., is now works manager, and H. F. Stratton, formerly in charge of the pattern, mold and core department, is the new superintendent.

Mr. Guay's appointment marks the culmination of eighteen years' diversified experience with the Fort Pitt Steel Casting Company, both in the sales and operating departments. He was for several years in the mechanical department of the Pennsylvania Railroad, prior to his connection with the Fort Pitt Steel Casting Company in 1908.

Mr. Stratton has been general foreman of the pattern, mold and core department of this company. He is a graduate of the mechanical engineering department of Purdue University, and before joining the Fort Pitt Steel Casting Company, in 1920, was for several years connected with the Isaac G. Johnson Company.

Westinghouse Company Announces Promotions

According to an announcement by E. D. Kilburn, vice-president and general sales manager, J. McA. Duncan, for fourteen years Pittsburgh district manager, has been promoted to assistant general sales manager of the Westinghouse Electric & Manufacturing Company. Mr. Duncan has been in the employ of the company for 40 years and has worked in almost every department. This wide experience, coupled with unusual executive ability, eventually led to his recent appointment. W. R. Marshall, formerly branch manager of Buffalo, has been selected to assume the duties of Pittsburgh district manager. These appointments are effective May 1.

In addition to these appointments, H. F. Boe, formerly industrial division manager at Buffalo, has been promoted to branch manager of that office and R. L. Kimber to industrial division manager. W. F. Barnes is appointed branch manager of the Tulsa office of the Westinghouse company.

Four to One Split in G.E. Stock Approved

Stockholders of the General Electric Company at the annual meeting in Schenectady on May 11 approved the plan to change the present authorized common stock of 1,850,000 shares of the par value of $100 each into 7,400,000 shares of common stock without par value. This was in accord with the recommendation of the board of directors the previous month to split the stock on a 4 to 1 basis. Myron F. Westover, secretary of the company, was elected to the board of directors, filling the vacancy caused by the death of E. R. Stettinius, New York. Other directors were re-elected.

When Different Fares Were Rung on the Same Register

The great advance which has taken place in the last 25 years in methods of fare collection and registration is well illustrated in the little pamphlet recently published by the Ohmer Fare Register Company, Dayton, Ohio. It is a reprint of an address delivered by John F. Ohmer before the Pennsylvania Street Railway Association in 1903, and pointed out the objections to the then common practice of having a variety of fares rung up on a single register. As a substitute for this method, Mr. Ohmer outlined the now familiar capa-

ELECTRIC RAILWAY MATERIAL PRICES—May 11, 1926

Metals—New York

Copper, electrolytic, cents per lb.	13.90
Lead, cents per lb.	7.75
Nickel, cents per lb.	35.00
Zinc, cents per lb.	7.12
Tin, Straits, cents per lb.	64.25
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	56.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.625
Somerset mine run, Boston	2.00
Pittsburgh mine run, Pittsburgh	1.825
Franklin, Ill., screenings, Chicago	1.925
Central, Ill., screenings, Chicago	1.575
Kansas screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.90
Tie plates (flat type), cents per lb.	2.30
Angle bars, cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.25
Steel bars, cents per lb.	2.00
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.35

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (28 gage), cents per lb.	3.15
Sheet iron, galvanized (28 gage), cents per lb.	4.40
Galvanized barbed wire, cents per lb.	3.35
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	12–18
Waste, cotton (100 lb. bale), cents per lb.:	
White	13–17.50
Colored	10–14

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	11.2
White lead in oil (100 lb. keg), cents per lb.	15.00
Turpentine (bbl. lots), per gal.	$0.92
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4–6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire, cents per lb.	16.00
Rubber-covered wire, No. 14, per 1,000 ft.	$6.25
Weatherproof wire base, cents per lb.	18.00

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$147
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.10
Gravel, ¾-in., cu.yd., f.o.b. N.Y.	1.75
Sand, cu.yd., f.o.b. N.Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.50
Light copper, cents per lb.	9.50
Heavy brass, cents per lb.	7.125
Zinc, old scrap, cents per lb.	4.25
Lead, cents per lb. (heavy)	6.75
Steel car axles, Chicago, net ton	$17.25
Cast iron car wheels, Chicago, gross ton	17.75
Rails (short), Chicago, gross ton	16.75
Rails, (relaying), Chicago, gross ton	25.50
Machine turnings, Chicago, gross ton	7.75

bilities of his recording register and its advantages to conductors, railway and accountants.

In 1903 the ideas outlined in the paper mentioned seemed revolutionary, but the advantages were so evident as to make a strong appeal. Among the companies now using Ohmer fare registers, there are 148 which have employed the register for periods varying from ten to twenty-six years, and most of this number have been users of the register for more than twenty years.

Unfilled Orders for 73 Electric Locomotives

During the month of April twelve electric locomotives were shipped for domestic use and sixteen for foreign use, according to figures compiled by the Department of Commerce. At the end of the month there were unfilled orders for 44 electric locomotives for domestic purchasers and 29 for foreign railways. These figures compare with eleven domestic deliveries and one foreign delivery in March and unfilled orders for 50 domestic and 41 foreign also at the end of March.

Montreal Cars to Have Plymetl Sides and Agasote Headlining

Plymetl, manufactured by the Haskelite Manufacturing Company, will be used for side panels on the 50 new cars being built for the Montreal Tramways, Montreal, Que. The cars are being constructed by the Canadian Car & Foundry Company. Abstracted specifications were published in the issue of this paper for May 8, 1926, page 830, which were in error in giving the material used for headlining. Agasote manufactured by the Pantasote Company, Inc., will be used on these cars.

Tire Man Talks on Balloons for Buses

Balloon tires for buses are coming into popularity fast. This was one of the statements made by William O'Neil, president of the General Tire & Rubber Company, recently, in the course of a summary of the progress of the industry. According to Mr. O'Neil tire engineers have been as active as automobile and bus engineers in bringing every possible comfort and improvement to this fast-growing new mode of transportation.

Interesting as was Mr. O'Neil's summary of the progress of the bus, his remarks about tires deserve particular attention. Among other things he said:

> Pneumatic tires were the first big innovation, but were of doubtful value for a time because the old, cross-woven type of fabric construction was used and fabric tires absolutely refused to stand up. With the appearance of the cord tire the situation improved and cord tires made pneumatics for buses possible. General was among the very first in the field with pneumatic cord tires for the bus, and has followed bus and bus tire development very closely from the beginning.

Mr. O'Neil said that his company's latest contribution to the art is the balloon tire for bus service—strong and sturdy enough to carry the loads and bear the strains, and having large enough air spaces to provide the utmost comfort for passengers and protection for mechanism. Of this particular development he said:

> The greater cushion makes greater speed possible as well and it now seems likely that within a short time most buses will be on balloon tires. Many thousand General balloons are already in bus service and the results are most gratifying to all concerned.

Rolling Stock

Boston Elevated Railway, Boston, Mass., has purchased five 29-passenger city type Mack buses, making 85 units of this type in its large fleet.

Twin City Rapid Transit Company, Minneapolis, Minn., has ordered one Differential electric locomotive crane car from the Differential Steel Car Company of Findlay, Ohio. This car will be equipped with four G.E.-275 motors with type M control, a master controller to be located in the craneman's turret as well as in the front cab of the car.

Track and Line

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., plans to double track a portion of its line in Milwaukee lying north of Harrison Street.

Wisconsin Power & Light Company, Oshkosh, Wis., will rebuild its interurban track in Plymouth. As soon as this work is completed similar track rebuilding improvements will be carried out on West Irving Street in Oshkosh.

Rockford City Traction Company, Rockford, Ill., has received permission to spend $4,000 to $5,000 for new rails. They will be placed on East and West State Streets, South Main and Seventh Streets.

Springfield Street Railway, Springfield, Mass., through General Manager Herbert M. Flanders, has announced the company's immediate program for the construction and improvement of its trolley track. The initial work along this line calls for an expenditure of $25,000 for relaying the double track on State Street between Pine Point and Bay Road. A section of track in Longmeadow is also to be relaid for a distance of ¼ mile.

Trade Notes

H. N. Goodell has been made district manager of the Western district of the Graybar Electric Company. This appointment was made known coincident with the announcement of transfer of headquarters of the Western district from St. Louis to Kansas City.

Ludlum Steel Company, Watervliet, N. Y., is building a continuous furnace of modern construction and design for billet heating. In the recuperative equipment is employed Ludlum's own heat and scale-resisting material.

Ward B. Maurer has been placed in charge of the new branch office opened by American Hoist & Derrick Company, 1943 Railway Exchange Building, St. Louis, Mo. Mr. Maurer has a wide acquaintanceship with railway men and users of hoisting machinery in general. Before joining the sales force of the American Hoist & Derrick Company several years ago, he was a member of the engineering staff of the Baltimore & Ohio Railroad.

R. L. Cluverius has been appointed Southern department manager of the National Railway Appliance Company, with headquarters in the Munsey Building, Washington, D. C., succeeding H. W. Kidwell, resigned.

Graybar Electric Company announces the appointment of W. B. DeForest as sales manager of its New York offices. Mr. DeForest, previous to his new appointment, was Kansas City branch manager. He brings to his new position the benefit of seventeen years' experience with the Western Electric Company.

Western Electric Company has just opened a new distributing branch house at 50-52 Portland Street, Worcester, Mass. W. A. Searle has been appointed sales manager of this branch, operated by the Boston Supply House as a part of the campaign for better service in the New England territory.

Sullivan Machinery Company, Chicago, Ill., announces that its Knoxville, Tenn., office has just moved from the old location at 614 Market Street to new and larger offices at Room 611-15 General Building, 623 Market Street. E. L. Thomas is manager of the Knoxville branch.

New Advertising Literature

Graybar Electric Company, Inc., New York, N. Y., has issued its 1926 fan catalog, with complete information on all models of fans built by the company.

Quigley Furnace Specialties Company, Inc., New York, N. Y., has issued a booklet entitled "The Quigley Refractory Gun." Information is included therein on the use of this equipment in furnace maintenance, meeting the problem of keeping furnaces at full capacity with minimum shutdowns for repairs. Directions are given for the preparation and use of Hytempite, which is recommended for use as a bond for the ganister.

General Electric Company, Schenectady, N. Y., has issued a 33-page illustrated bulletin, No. GEA-232, entitled "Power Factor and Means for Its Improvement." It is a practical treatise on power factor with the mathematics reduced to simple arithmetic.

Billings & Spencer Company, Hartford, Conn., has issued the 36th edition of its annual catalog of drop-forged tools. It has been the endeavor of the manufacturer to make this catalog a handy guide for all men in wrench-using trades. In addition to the regular Billings numbers, the trade numbers of open-end wrenches are given, and convenient reference may be found in the wrench index table giving dimensions of wrench openings to fit standard nut and bolt sizes. Several new products are listed, such as the chrome-molybdenum tappet and check-nut wrenches and a complete line of chrome - molybdenum "Life - time" wrenches.

Create Public Good Will with Comfortable Seats—

Brill

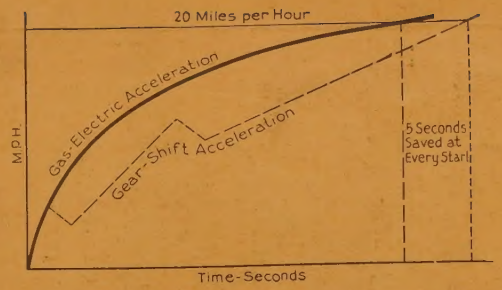
No. 105-B Type for Single-end Cars

MANY electric railways are demonstrating the importance of comfortable seats in creating favorable public relations. Greater consideration is being given to this factor, resulting in the development of many types of car seats in which comfort and appearance are outstanding features.

The Brill No. 105 type illustrated, upholstered in plush, with deep soft cushions and back set at the right pitch for relaxation, was recently specified for an order of 30 single-end cars under construction.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

Faster Schedules



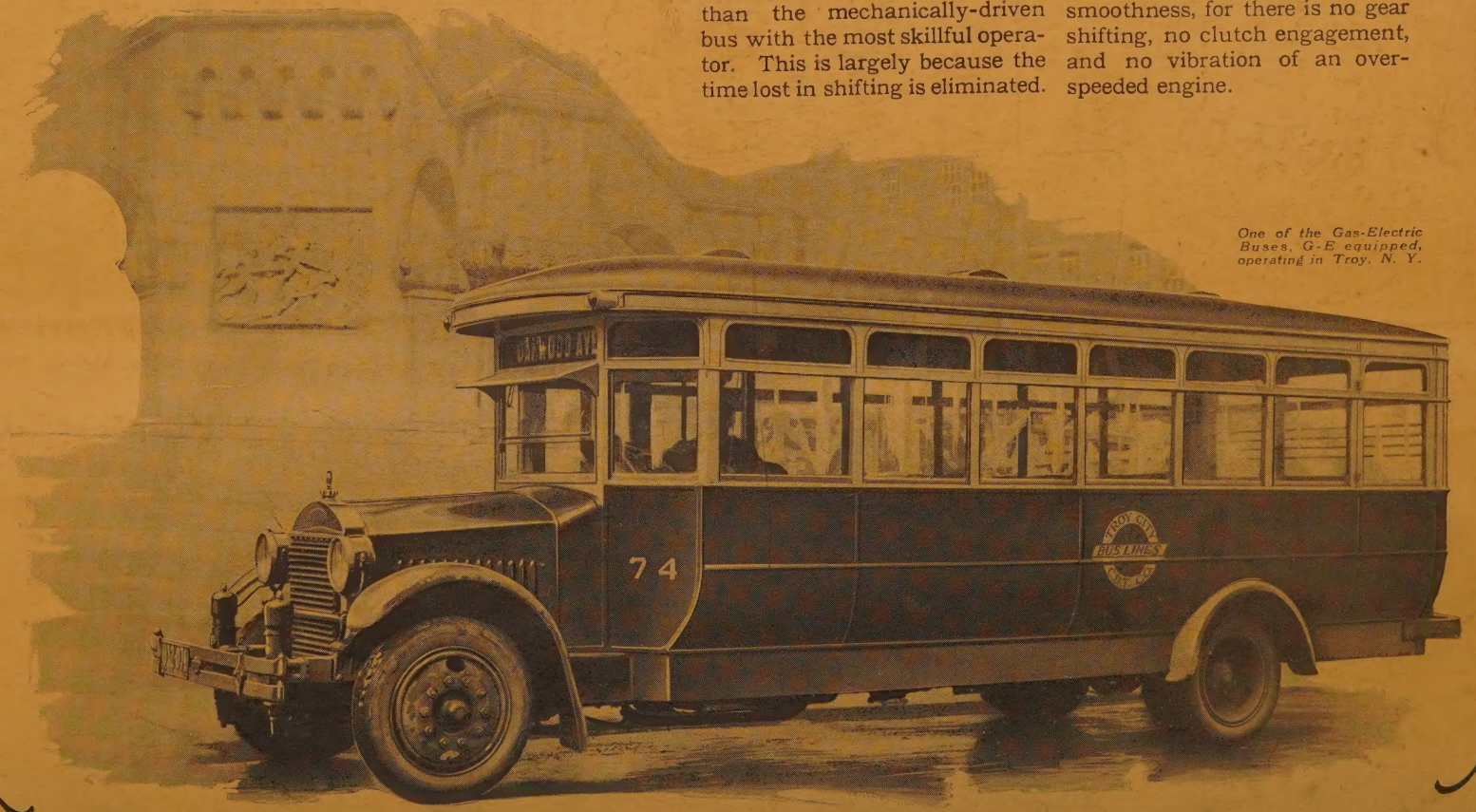
Gas-Electrics go ahead while others "shift"

THIS is not merely a theoretical computation, nor a manufacturer's claim, but a fact demonstrated in competitive tests and by actual operating experience.

In a series of tests, the gas-electric bus accelerated to 20 miles per hr. in 5 sec. less time than the mechanically-driven bus with the most skillful operator. This is largely because the time lost in shifting is eliminated.

Gas-electric buses in service are making schedules approximately 20% faster than other types.

Its ability to accelerate makes the Gas-Electric Bus the easiest to manoeuvre in crowded city streets. Its faster acceleration is accomplished with unusual smoothness, for there is no gear shifting, no clutch engagement, and no vibration of an over-speeded engine.



One of the Gas-Electric Buses, G-E equipped, operating in Troy, N. Y.

General Electric's years of experience in furnishing electric motive-power equipment, aided by complete facilities for new development, have insured this Company's success with Gas-Electric Drive. In addition General Electric has acquired a comprehensive experience with Gas-Electric Bus equipment.

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, NEW YORK

SALES OFFICES IN ALL PRINCIPAL CITIES